Table A-1 Gasoline (C4-C12), Diesel (C12-C23), and Motor Oil (C23-C40) — SW-846 Method 8015B Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial Calibration	Each time the instrument is set up and when CCV standard acceptance criteria are not met. Initial calibration consists of a minimum of five concentrations levels (one standard must be at or below reporting limit). Heated purge required for calibration standards associated with solid samples for GRO analysis.	If %RSD≤20% for CFs for each target and surrogate compound quantitate using average CF. Generate a calibration curve for analytes which do not meet this criterion. The calibration curve must have a correlation coefficient (R) ≥0.99 or a coefficient of determination (R^2) ≥0.99.	1. %RSDs >20% require quantitation using a calibration curve. 2. If the %RSD >20%, R<0.99, and R^2 <0.99 for a target compound, a new initial calibration must be performed.
Initial Calibration Verification (ICV) Standard and Continuing Calibration Verification (CCV) Standard	ICV will be analyzed at the beginning of the daily sequence, unless initial calibration is performed. CCVs must bracket each set of 10 sample analyses (inclusive of all laboratory and field QC). The concentration of the CCV standard must be at or near the mid-point of the calibration range of the instrument. Heated purge required for calibration standards associated with solid samples for GRO analysis.	1. For each target and surrogate compound ≤15%D based on "true" concentration when quantitated as a sample. 2. RT of each target compound must be within RT window (reset daily at the beginning of the sequence for the 24-hour day and only permitted once per 24 hours).	Correct system, if necessary, and recalibrate. Criteria must be met before sample analysis may begin. Reanalyze all samples and QC not bracketed by compliant CCV standards. Exception: If there are no positive results (results for the noncompliant target compound are <detection limit) in the associated samples, and the noncompliant CCV standard shows increased sensitivity (*i.e.*, CCV standard target compound recovery >115%) no further action needed.
Retention Time (RT) Windows	1. Established at ±3-sigma of the mean RT of each compound determined over 72 hours (if window is too narrow, use default windows per SW-846 Method 8000B [Section 7.6]). 2. Recentered daily based on RT of each of the compounds in the daily ICV.	Refer to Frequency column (left) regarding RT window Acceptance Criteria. RT windows for target compounds must not overlap and recentering the retention time windows is only permitted once per 24 hours.	Adjust system and recalibrate.

Table A-1 Gasoline (C4-C12), Diesel (C12-C23), and Motor Oil (C23-C40) — SW-846 Method 8015B Quality Control Requirements-Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Retention Time (RT) Shift	Each CCV analysis: RTs of analytes in the CCV are evaluated against the daily ICV.	Column and compound specific, varies with each ICV: compound should be within window established by ICV RT ± the calculated RT window or a default based on the calculated RT window.	1. Inspect chromatographic system for malfunctions; correct identified malfunctions, if appropriate. 2. Evaluate data based on a comparison with other standards run during the analytical sequence, consider the RTs for the surrogate and spiked compounds analyzed before and after the sample in question. i) Expand the RT windows to encompass the shift in compound location. ii) If no peaks are found in the expanded window, report the compound as non-detected.
Method Blank	One per batch of ≤20 samples of the same matrix per day. Must undergo all sample preparative procedures.	1. Concentration less than the reporting limit of the compound. Not applicable if positive results were not reported for any associated samples. 2. Must meet surrogate criteria.	1. Reanalyze blank to determine if instrument contamination was the cause. If the method blank is compliant upon reanalysis, then reanalyze all samples, unless samples contain >10× amount found in blank or there are no positive results. If the method blank is still non-compliant, then follow 2 or 3 below. 2. If the samples are within the holding time, then reextract and reanalyze all associated samples, unless samples contain >10× amount found in blank or there are no positive results. 3. If samples are past the holding time or if blank is still out after reanalysis, report both sets of data and notify QAM.

Table A-1 Gasoline (C4-C12), Diesel (C12-C23), and Motor Oil (C23-C40) — SW-846 Method 8015B Quality Control Requirements-Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Laboratory Control Sample (LCS)	One per batch of ≤ 20 samples per matrix per day. Must undergo all preparative procedures. The LCS must have a concentration at or near the mid-point of the calibration range.	Limits on Tables A-22 and A-23.	1. Reanalyze LCS. If the LCS is compliant upon reanalysis, then reanalyze all associated samples (see exception). If still non-compliant, then follow 2 or 3 below. 2. If the samples are within the holding time, then reprepare and reanalyze the LCS and all associated samples (see exception). 3. If samples are past the holding time or if LCS is still non-compliant after reanalysis, report both sets of data and notify QAM. Exception: If LCS recovery is high and there are no positive results (<detection limit) in the associated samples, then address in SDG Narrative and no further action needed.
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One per batch of ≤ 20 samples per matrix per concentration level per day. Must undergo all sample preparative procedures. Must be spiked with all target analytes at concentrations at or near the mid-point of the calibration range.	Limits on Tables A-22 and A-23.	1. If recoveries for the spiked compounds are not within limits, check for documentable errors (*e.g.*, calculations and spike preparation). 2. Check unspiked sample results and surrogate recoveries for indications of matrix effects. 3. If no errors are found and the associated LCS are within limits, then sample matrix effects are the most likely cause. Note in SDG Narrative.

Table A-1 Gasoline (C4-C12), Diesel (C12-C23), and Motor Oil (C23-C40) — SW-846 Method 8015B Quality Control Requirements-Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Internal Standards (Optional)	Add to all blanks, standards, QC samples, and samples.	1. Peak area within –50% to +100% of area in bracketing CCVs. 2. RT within 30 sec of RTs for bracketing CCVs.	1. Inspect instrument for malfunction; correct identified malfunctions, then reanalyze samples 2. If no instrument malfunction identified, proceed as follows: i) Reanalyze sample. ii) If reanalysis is out, report both sets of data and note in SDG Narrative. If in, report only second set. 3. If the sample was chosen for the MS/MSD analysis and the MS and/or MSD internal standards are outside limits, then no reanalysis is required.
Surrogate Compounds	1. Added to all standards, blanks, samples, and QC samples. 2. Calibrated and quantitated as target compounds.	Limits on Table A-27.	If recovery is not within limits: 1. Check to be sure that there are no errors in calculations and surrogate solutions. Also, check instrument performance. 2. If no problem is found, reprepare and reanalyze the sample. 3. If the reanalysis is within limits and holding times, then report only the reanalysis. 4. If the reanalysis is within limits, but out of holding time, then report both sets of data and note in SDG Narrative. 5. If the reanalysis is still out of limits, then report both sets of data and note in SDG Narrative. 6. If the sample was chosen for the MS/MSD analysis and the MS and/or MSD surrogate recoveries are outside limits, then no reanalysis is required.

Table A-1 Gasoline (C4-C12), Diesel (C12-C23), and Motor Oil (C23-C40) — SW-846 Method 8015B Quality Control Requirements-Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Qualitative/Quantitative Issues	1. If instrument level of any compound in a sample exceeds the instrument level of that compound in the highest level standard, the sample must be diluted to approximately mid-level of the calibration range and reanalyzed. 2. If the concentration of the target analyte that exceeded the calibration range is present in the sample analyzed immediately after the high level sample at a level ≤5× reporting limit, then that sample must be reanalyzed to determine if carryover occurred. 3. For each sample, evaluate the chromatographs for potential interferences.	1. The instrument level of all compounds must be within the calibration range for all samples. 2. The sample analyzed immediately after a high-level sample must display concentrations of the high-level target compounds greater than 5× reporting limit. 3. Sample chromatographs should not display levels of interference in the RT window of any target compound at a level greater than the reporting limit.	1. Dilute the sample to bring the level of the highest concentration of target compounds within the calibration range. 2. A sample, which was analyzed immediately after a high-level sample, displaying concentrations of target compounds ≤5× the reporting limit must be reanalyzed. If the results do not agree within the reporting limit, report only the second analysis. 3. If chromatographic interference is observed during the RT window of any target compound, then report in the SDG Narrative that the reported results are quantitatively estimated and are tentative identifications (flag "N"). A discussion regarding the qualitative and quantitative reliability of the analyses must be included in the SDG Narrative.

Table A-2 Organochlorine Pesticides — SW-846 Method 8081A Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial Calibration (Quantitation Column - used for all samples)	Each time the instrument is set up and when CCV acceptance criteria are not met. Initial calibration consists of a minimum of five concentrations levels (one standard must be at or below reporting limit).	If %RSD≤20% for CFs for each target and surrogate compound quantitated using average CF. Generate a calibration curve for analytes which do not meet this criterion. The calibration curve must have a correlation coefficient (R) ≥0.99 or a coefficient of determination (R^2) ≥0.99. Evaluate endrin and 4,4´-DDT for degradation (degradation of each compound must not exceed 15%).	1. %RSDs>20% require quantitation using a calibration curve. 2. If the %RSD>20%, R<0.99, and R^2<0.99 for a target compound, a new initial calibration must be performed.
Confirmation Column	One standard at reporting limit.	The peaks for each target compound must be distinct and identifiable on the chromatographs.	Correct system and reanalyze.

Table A-2 Organochlorine Pesticides — SW-846 Method 8081A Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial Calibration Verification (ICV) Standard and Continuing Calibration Verification (CCV) Standard (Quantitation Column)	ICV will consist of all single-component analytes and will be analyzed at the beginning of the daily sequence, unless initial calibration is performed. CCVs will consist of all single-component analytes and must bracket each set of 10 sample analyses (including all laboratory and field QC samples). Do not analyze hexane or instrument blanks prior to ICV/CCVs. Note: if this method is to be used as a screen for PCBs, then the laboratory should analyze a low-concentration ICV standard for all PCB mixtures.	1. ≤15% D based on "true" concentration when quantitated as a sample. 2. RT of each compound must be within RT window (reset daily at the beginning of the sequence for the 24-hour day). NOTE: Each peak for which an average CF was generated must be evaluated and reported for multi-component analytes.	Correct system, if necessary, and recalibrate. Criteria must be met before sample analysis may begin. Reanalyze all field and QC samples that are not bracketed by compliant CCVs. If a failed CCV (*e.g.*, for an autosampler analysis) returns to acceptable calibration later in the sequence, samples following the acceptable CCV will be reported; samples between the failed CCV and subsequent compliant CCV and between the failed CCV and the previous compliant CCV will be reanalyzed.
Retention Time (RT) Windows	1. Established at ±3-sigma of the mean RT of each compound determined over 72 hours (if window is too narrow, use default windows per SW-846 Method 8000B [Section 7.6]). Must be established whenever a new column is installed. 2. Recentered daily based on RT of each of the compounds in the ICV.	Refer to Frequency column (left) regarding RT window Acceptance Criteria. RT windows for quantitation peaks of target compounds must not overlap. Recentering windows is permitted once per 24 hours.	Adjust system and recalibrate.

Table A-2 Organochlorine Pesticides — SW-846 Method 8081A Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Retention Time (RT) Shift	Each CCV analysis: RTs of analytes in the CCV are evaluated against the daily ICV.	Column and compound-specific, varies with each ICV: compound should be within window established by ICV RT ± the calculated RT window or a default based on the calculated RT window.	1. Inspect chromatographic system for malfunction; correct identified malfunctions, if appropriate. 2. Evaluate data based on a comparison with other standards run during the analytical sequence, consider the RTs for the surrogate and spiked compounds analyzed before and after the sample in question. i) Expand the RT windows to encompass the shift in compound location. ii) If no peaks are found in the expanded window, report the compound as non-detect. iii) If peaks are present, use the confirmation column to verify identification.
Instrument Blank	Must bracket each set of 10 sample analyses (analyze immediately after CCV).	1. All target compounds <reporting limit. Not applicable if positive results were not reported for any of the associated samples. 2. Must meet surrogate criteria.	Reanalyze blank and associated samples.

Table A-2 Organochlorine Pesticides — SW-846 Method 8081A Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Method Blank	One per extraction batch of ≤ 20 samples per matrix per day. Must undergo all sample preparative procedures. Do not analyze hexane or instrument blanks prior to method blanks.	1. Concentration less than the reporting limit of the compound. Not applicable if positive results were not reported for any associated samples. 2. Must meet surrogate criteria.	1. Reanalyze blank to determine if instrument contamination was the cause. If the method blank is compliant upon reanalysis, then reanalyze all samples (unless samples contain >10× amount found in blank or there are no positive results). If the method blank is still non-compliant, then follow 2 or 3 below. 2. If the samples are within the holding time, then reextract and reanalyze all associated samples, unless samples contain >10× amount found in blank or there are no positive results. 3. If samples are past the holding time or if blank is still out after reanalysis, report both sets of data and notify QAM.

Table A-2 Organochlorine Pesticides — SW-846 Method 8081A Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Laboratory Control Sample (LCS)	One per extraction batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures. The LCS must have concentrations of the target analytes, except multi-peak and coeluting analytes, at the mid-point of the calibration curve.	Limits on Tables A-22, A-23, and A-26.	1. Reanalyze LCS. If the LCS is compliant upon reanalysis, then reanalyze all associated samples (see exception). If still non-compliant, then follow 2 or 3 below. 2. If the samples are within the holding time, then reextract and reanalyze the LCS and all associated samples (see exception). 3. If samples are past the holding time or if LCS is still non-compliant after reanalysis, report both sets of data and notify QAM. Exception: If LCS recovery is high and there are no positive results (<detection limit) in the associated samples, then address in SDG Narrative and no further action needed.
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One per extraction batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures. The MS/MSD sample must be spiked with all target analytes, except multi-peak and coeluting analytes, at concentrations at or near the mid-range of the calibration curve.	Limits on Tables A-22, A-23, and A-26.	1. If recoveries for the spiked compounds are not within limits, check for documentable errors (*e.g.*, calculations and spike preparation). 2. Check unspiked sample results and surrogate recoveries for indications of matrix effects. 3. If no errors are found and the associated LCS are within limits, then sample matrix effects are the most likely cause. Note in SDG Narrative.

Table A-2 Organochlorine Pesticides — SW-846 Method 8081A Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Surrogate Compounds (Recovery calculated from results obtained on the quantitation column.)	1. Added to all standards, blanks, samples, and QC samples. 2. Calibrated and quantitated as a target compound.	Limits on Table A-27.	If recovery is not within limits: 1. Check that there are no errors in calculations and surrogate solutions. Also, check instrument performance. 2. If no problem is found, reextract and reanalyze the sample. 3. If the reanalysis is within limits, then report only the reanalysis. 4. If the reanalysis is within limits but out of holding time, then report both sets of data. 5. If the reanalysis is still out of limits, then report both sets of data. 6. If the sample was chosen for the MS/MSD analysis, and the MS and/or MSD surrogate recoveries are outside limits, no reanalysis is required.
Internal Standards (Optional)	Add to all blanks, standards, QC samples, and samples.	1. Peak area within –50% to +100% of area in bracketing CCVs. 2. RT within 30 sec of RTs for bracketing CCVs.	1. Inspect instrument for malfunction; correct identified malfunctions, then reanalyze samples. 2. If no instrument malfunction identified, proceed as follows: i) Reanalyze sample. ii) If reanalysis is out, report both sets of data. If in, report only second set. 3. If the sample was chosen for the MS/MSD analysis and the MS and/or MSD internal standards are outside limits, then no reanalysis is required.

Table A-2 Organochlorine Pesticides — SW-846 Method 8081A Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Qualitative/Quantitative Issues	1. If the instrument level of any compound in a sample exceeds the instrument level of that compound in the highest level standard, the sample must be diluted to approximately mid-level of the calibration range and reanalyzed. 2. For each sample, evaluate the chromatographs for possible interferences. 3. Each positive result must be qualitatively confirmed by analysis on a second, dissimilar column. 4. If the concentration of the target analyte that exceeded the calibration range is present in another sample analyzed immediately after the high level sample and is greater than the reporting limit but ≤5× reporting limit, then that sample must be reanalyzed to determine if carryover occurred.	1. The instrument level of all compounds must be within the calibration range for all samples. 2. Sample chromatographs should not display levels of interference in the RT window of any target compound at a level greater than the reporting limit. 3. All results must be quantitated on and reported from the primary column but confirmed on a second dissimilar column. 4 The sample analyzed immediately after a high-level sample must display concentrations of the high-level target compounds less than the reporting limit or greater than 5× reporting limit.	1. Dilute the sample to bring the level of the highest concentration of target compounds within the calibration range. 2. If chromatographic interference is observed during the RT window of any target compound, then report in the SDG Narrative that the reported results are quantitatively estimated and are tentative identifications (flag "N"). 3. A discussion regarding the qualitative and quantitative reliability of the analyses must be included in the SDG Narrative. 4. A sample displaying concentrations of target compounds between the reporting limit and 5× reporting limit analyzed immediately after a high-level sample must be reanalyzed. If the results do not agree within the reporting limit, report only the second analysis.

Table A-3 Polychlorinated Biphenyls - SW-846 Method 8082 Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial Calibration (Quantitation Column - used for all samples)	Established initially and when CCV fails criteria at five concentration levels for Aroclor 1016/1260 combined. One standard at or below the reporting limit. One standard calibration for the remaining Aroclor mixtures, at concentrations near the middle of the linear range of the analysis.	If %RSD≤20% for CFs for each surrogate and Aroclor mixture quantitate using average CF. Generate calibration curve for analytes which do not meet this criterion. The calibration curve must have a correlation coefficient (R) ≥0.99 or a coefficient of determination (R^2) ≥0.99. Each Aroclor must display distinctive pattern for multipeak analytes.	1. %RSDs>20% require quantitation using a calibration curve. 2. If the %RSD >20%, R<0.99, and R^2 <0.99 for a target analyte a new initial calibration must be performed.
Confirmation Column	One standard at reporting limit for each Aroclor mixture.	Must display distinctive pattern for multipeak analytes.	Correct system and reanalyze.

Table A-3 Polychlorinated Biphenyls - SW-846 Method 8082 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial Calibration Verification (ICV) Standard and Continuing Calibration Verification (CCV) Standard (Quantitation Column)	ICV will be analyzed at the beginning of the daily sequence (when >2-hour break in continuous analysis, all analytes), unless initial calibration is performed. CCVs must bracket each set of 10 sample analyses (including all laboratory and field QC samples). ICV will consist of the Aroclor 1016/1260 mixture, and CCV will consist of the Aroclor 1016/1260 mixture every 10 samples. Do not analyze hexane or instrument blanks prior to ICV/CCVs.	1. ≤15% D based on "true" concentration when quantitated as a sample. 2. RT of each peak used for identification of the Aroclor must be within RT window (reset daily at the beginning of the sequence for the 24-hour day). NOTE: Each peak selected for an Aroclor must be evaluated and reported.	Correct system, if necessary, and recalibrate. Criteria must be met before sample analysis may begin. Reanalyze all field and QC samples that are not bracketed by compliant CCVs. If a failed CCV (*e.g.*, for an autosampler analysis) returns to acceptable calibration later in the sequence, samples following the acceptable CCV will be reported; and samples between the failed CCV and subsequent compliant CCV will be reanalyzed.
Retention Time (RT) Windows	1. Established at ±3-sigma of the mean RT of each compound determined over 72 hours (if window is too narrow, use default windows per SW-846 Method 8000B [Section 7.6]). Must be established whenever a new column is installed. 2. Recentered daily based on RT of each of the peaks used for Aroclor identification in the daily ICV.	Refer to Frequency column (left) regarding RT window Acceptance Criteria. RT windows for quantitation peaks of the Aroclors must not overlap. Recentering windows is permitted once per 24 hours.	Adjust system and recalibrate.

Table A-3 Polychlorinated Biphenyls - SW-846 Method 8082 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Retention Time (RT) Shift	Each CCV analysis: RTs of the peaks chosen for the identification of the Aroclors in the CCV are evaluated against the daily ICV.	Column and peak-specific, varies with each ICV: peak should be within window established by ICV RT ± the calculated RT window or a default based on the calculated RT window.	1. Inspect chromatographic system for malfunction; correct identified malfunctions, if appropriate. 2. Evaluate data based on a comparison with other standards run during the analytical sequence, consider the RTs for the surrogate and spiked Aroclors analyzed before and after the sample in question. i) Expand the RT windows to encompass the shift in Aroclor peak location. ii) If no peaks are found in the expanded window, report the compound as non-detect. iii) If peaks are present, use the confirmation column to verify identification.

Table A-3 Polychlorinated Biphenyls - SW-846 Method 8082 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Internal Standards (Optional)	Add to all blanks, standards, QC samples, and samples.	1. Peak area within –50% to +100% of area in bracketing CCVs. 2. RT within 30 sec of RTs for bracketing CCVs.	1. Inspect instrument for malfunction; correct identified malfunctions, then reanalyze samples. 2. If no instrument malfunction identified, proceed as follows: i) Reanalyze sample. ii) If reanalysis is out, report both sets of data and note in SDG Narrative. If in, report only second set. 3. If the sample was chosen for the MS/MSD analysis and the MS and/or MSD internal standards are outside limits, then no reanalysis is required.
Instrument Blank	Must bracket each set of 10 sample analyses.	1. All Aroclors <reporting limit. Not applicable if positive results were not reported for any associated samples. 2. Must meet surrogate criteria.	Reanalyze blank and associated samples.

Table A-3 Polychlorinated Biphenyls - SW-846 Method 8082 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Method Blank	One per extraction batch of ≤20 samples of the same matrix per day. Must undergo all sample preparative procedures. Do not analyze hexane or instrument blanks prior to method blanks.	1. All Aroclors <reporting limit. Not applicable if positive results were not reported for any associated samples. 2. Must meet surrogate criteria.	1. Reanalyze blank to determine if instrument contamination was the cause. If the method blank is compliant upon reanalysis, then reanalyze all samples, unless samples contain >10× amount found in blank or there are no positive results. If the method blank is still non-compliant, then follow 2 or 3 below. 2. If the samples are within the holding time, then reextract and reanalyze all associated samples, unless samples contain >10× amount found in blank or there are no positive results. 3. If samples are past the holding time or if blank is still out after reanalysis, report both sets of data and notify QAM.

Table A-3 Polychlorinated Biphenyls - SW-846 Method 8082 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Laboratory Control Sample (LCS)	One per extraction batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures. The LCS must have concentrations of two chromatographically distinct target Aroclors at the mid-point of the calibration curve.	Limits on Tables A-22, A-23, and A-25.	1. Reanalyze LCS. If the LCS is compliant upon reanalysis, then reanalyze all associated samples (see exception). If still non-compliant, then follow 2 or 3 below. 2. If the samples are within the holding time, then reextract and reanalyze the LCS and all associated samples (see exception). 3. If samples are past the holding time or if LCS is still non-compliant after reanalysis, report both sets of data and notify QAM. Exception: If LCS recovery is high and there are no positive results (<detection limit) in the associated samples, then address in SDG Narrative and no further action needed.
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One per extraction batch of ≤20 samples per matrix per day. The MS/MSD sample must be spiked with two chromatographically distinct target Aroclors at concentrations at or near the mid-range of the calibration curve.	Limits on Tables A-22, A-23, and A-25.	1. If recoveries for the spiked Aroclors are not within limits, check for documentable errors (*e.g.*, calculations and spike preparation). 2. Check unspiked sample results and surrogate recoveries for indications of matrix effects. 3. If no errors are found, and the associated LCS are within limits, then sample matrix effects are the most likely cause. Note in SDG Narrative.

Table A-3 Polychlorinated Biphenyls - SW-846 Method 8082 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Surrogate Compounds (Recovery calculated from results obtained on the quantitation column.)	1. Added to all standards, blanks, samples, and QC samples. 2. Calibrated as a target compound in the Aroclor 1016 and 1260 standards.	Limits on Table A-27.	If recovery is not within limits: 1. Check to be sure that there are no errors in calculations and surrogate solutions. Also, check instrument performance. 2. If no problem is found, reextract and reanalyze the sample. 3. If the reanalysis is within limits and holding time, then report only the reanalysis. 4. If the reanalysis is within limits, but out of hold, then report both sets of data and note in SDG Narrative. 5. If the reanalysis is still out of limits, then report both sets of data and note in SDG Narrative. 6. If the sample was chosen for the MS/MSD analysis and the MS and/or MSD surrogate recoveries are outside limits, then no reanalysis is required.
Sulfuric Acid Cleanup	All samples for PCB only.	Not applicable.	Not applicable.

Table A-3 Polychlorinated Biphenyls - SW-846 Method 8082 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Qualitative/Quantitative Issues	1. If instrument level of any Aroclor in a sample exceeds the instrument level of that Aroclor in the highest level standard, the sample must be diluted to approximately mid-level of the calibration range and reanalyzed. 2. If chromatographic interference is observed during the RT window of any peak used for Aroclor identification and quantitation, a different peak may be chosen for the identification and quantitation of the Aroclor. If severe interferences exist, and the identity of any Aroclor is prevented by the interferences, the laboratory shall discuss the issue in the SDG Narrative.	1. The instrument level of all Aroclors must be within the calibration range for all samples. 2. Sample chromatograms should not display levels of interference in the RT window of any Aroclor at a level greater than the reporting limit.	1. Dilute the sample to bring the level of the highest concentration of Aroclors within the calibration range. 2. A discussion regarding the qualitative and quantitative reliability of the analyses must be included in the SDG Narrative.

Table A-4 Herbicides — SW-846 Method 8151A Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial Calibration (Quantitation Column - used for all samples)	Each time the instrument is set up and when CCV acceptance criteria are not met. Initial calibration consists of a minimum of five concentrations levels (one standard must be at or below reporting limit).	If %RSD≤20% for CFs for each target and surrogate compound quantitated using average CF. Generate a calibration curve for analytes which do not meet this criterion. The calibration curve must have a correlation coefficient (R) ≥0.99 or a coefficient of determination (R^2) ≥0.99.	1. %RSDs>20% require quantitation using a calibration curve. 2. If the %RSD>20%, R<0.99, and R^2 <0.99 for a target compound, a new initial calibration must be performed.
Initial Calibration Verification (ICV) Standard and Continuing Calibration Verification (CCV) Standard (Quantitation Column)	ICV will be analyzed at the beginning of the daily sequence, unless initial calibration is performed. CCVs must bracket each set of 10 sample analyses (including all laboratory and field QC samples). Do <u>not</u> analyze hexane or instrument blanks prior to ICV/CCVs.	1. ≤15% D based on "true" concentration when quantitated as a sample. 2. RT of each compound must be within RT window (reset daily at the beginning of the sequence for the 24-hour day).	Correct system, if necessary, and recalibrate. Criteria must be met before sample analysis may begin. Reanalyze all field and QC samples that are not bracketed by compliant CCVs. If a failed CCV (*e.g.*, for an autosampler analysis) returns to acceptable calibration later in the sequence, samples following the acceptable CCV will be reported; samples between the failed CCV and subsequent compliant CCV and between the failed CCV and the previous compliant CCV will be reanalyzed.
Retention Time (RT) Windows	1. Established at ±3-sigma of the mean RT of each compound determined over 72 hours (if window is too narrow, use default windows per SW-846 Method 8000B [Section 7.6]). Must be established whenever a new column is installed. 2. Recentered daily based on RT of each of the compounds in the daily ICV.	Refer to Frequency column (left) regarding RT window Acceptance Criteria. RT windows for quantitation peaks of the target compounds must not overlap. Recentering windows is permitted once per 24 hours.	Adjust system and recalibrate.

Table A-4 Herbicides — SW-846 Method 8151A Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Retention Time (RT) Shift	Each CVS analysis: RT of analytes in the CVS are evaluated against the daily ICV.	Column and compound specific, varies with each ICV: compound should be within window established by ICV RT ± the calculated RT window or a default based on the calculated RT window.	1. Inspect chromatographic system for malfunction; correct identified malfunctions, if appropriate. 2. Evaluate data based on a comparison with other standards run during the analytical sequence, consider the RTs for the surrogate and spiked compounds analyzed before and after the sample in question. i) Expand the RT windows to encompass the shift in compound location. ii) If no peaks are found in the expanded window, report the compound as non-detect. iii) If peaks are present, use the confirmation column to verify identification.
Instrument Blank	Must bracket each set of 10 sample analyses (analyze immediately after CCV).	1. All target compounds <reporting limit. Not applicable if positive results were not reported for any of the associated samples. 2. Must meet surrogate criteria.	Reanalyze blank and associated samples.

Table A-4 Herbicides — SW-846 Method 8151A Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Method Blank	One per extraction batch of ≤20 samples per matrix per day. Must undergo all preparative procedures. Do not analyze hexane or instrument blanks prior to method blanks.	1. Concentration less than the reporting limit of the compound. Not applicable if positive results were not reported for any associated samples. 2. Must meet surrogate criteria.	1. Reanalyze blank to determine if instrument contamination was the cause. If the method blank is compliant upon reanalysis, then reanalyze all samples, unless samples contain >10× amount found in blank or there are no positive results. If the method blank is still non-compliant, then follow 2 or 3 below. 2. If the samples are within the holding time, then reextract and reanalyze all associated samples, unless samples contain >10× amount found in blank or there are no positive results. 3. If samples are past the holding time or if blank is still out after reanalysis, report both sets of data and notify QAM.

Table A-4 Herbicides — SW-846 Method 8151A Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Laboratory Control Sample (LCS)	One per batch of ≤20 samples per matrix per day. Must undergo all preparative procedures. The LCS must have concentrations of the target analytes at the mid-point of the calibration curve.	Limits on Tables A-22, A-23, and A-26.	1. Reanalyze LCS. If the LCS is compliant upon reanalysis, then reanalyze all associated samples (see exception). If still non-compliant, then follow 2 or 3 below. 2. If the samples are within the holding time, then reextract and reanalyze the LCS and all associated samples (see exception). 3. If samples are past the holding time or if LCS is still non-compliant after reanalysis, report both sets of data and notify QAM. Exception: If LCS recovery is high and there are no positive results (<detection limit) in the associated samples, then address in SDG Narrative and no further action needed.
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One per extraction batch ≤20 samples per matrix per day. Must undergo all preparative procedures. The MS/MSD must be spiked with all target compounds at levels at or near the mid-point of the calibration range.	Limits on Tables A-22, A-23, and A-26.	1. If recoveries for the spiked compounds are not within limits, check for documentable errors (*e.g.*, calculations and spike preparation). 2. Check unspiked sample results and surrogate recoveries for indications of matrix effects. 3. If no errors are found and the associated LCS are within limits, then sample matrix effects are the most likely cause. Note in SDG Narrative.

Table A-4 Herbicides — SW-846 Method 8151A Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Surrogate Compounds (Recovery calculated from results obtained on the quantitation column.)	1. Added to all standards, blanks, samples, and QC samples. 2. Calibrated and quantitated as target compounds.	Limits on Table A-27.	If recovery is not within limits: 1. Check to be sure that there are no errors in calculations, surrogate solutions, and internal standards. Also, check instrument performance. 2. If no problem is found, reextract and reanalyze the sample. 3. If the reanalysis is within limits and holding times, then report only the reanalysis. 4. If the reanalysis is within limits, but out of hold, then report both sets of data. 5. If the reanalysis is still out of limits, then report both sets of data. 6. If the sample was chosen for the MS/MSD analysis, and the MS and/or MSD are outside limits, then no reanalysis is required.
Internal Standards (Optional)	Add to all blanks, standards, QC samples, and samples.	1. Peak area within –50% to +100% of area in bracketing CCVs. 2. RT within 30 sec of RTs for bracketing CCVs.	1. Inspect instrument for malfunction; correct identified malfunctions, then reanalyze samples. 2. If no instrument malfunction identified, proceed as follows: i) Reanalyze sample. ii) If reanalysis is out, report both sets of data. If in, report only second set. 3. If the sample was chosen for the MS/MSD analysis and the MS and/or MSD internal standards are outside limits, then no reanalysis is required.

Table A-4 Herbicides — SW-846 Method 8151A Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Qualitative/Quantitative Issues	1. If the instrument level of any compound in a sample exceeds the instrument level of that compound in the highest level standard, the sample must be diluted to approximately mid-level of the calibration range and reanalyzed. 2. For each sample, evaluate the chromatographs for possible interferences. 3. Each positive result must be qualitatively confirmed by analysis on a second, dissimilar column. 4. If the concentration of the target analyte that exceeded the calibration range is present in another sample analyzed immediately after the high level sample and is greater than the reporting limit but ≤5× reporting limit, then that sample must be reanalyzed to determine if carryover occurred.	1. The instrument level of all compounds must be within the calibration range for all samples. 2. Sample chromatographs should not display levels of interference in the RT window of any target compound at a level greater than the reporting limit. 3. All results must be quantitated on and reported from the primary column but confirmed on a second dissimilar column. 4. The sample analyzed immediately after a high-level sample must display concentrations of the high-level target compounds less than the reporting limit or greater than 5× Reporting Limit.	1. Dilute the sample to bring the level of the highest concentration of target compounds within the calibration range. 2. If chromatographic interference is observed during the RT window of any target compound, then report in the SDG Narrative that the reported results are quantitatively estimated and are tentative identifications (flag "N"). 3. A discussion regarding the qualitative and quantitative reliability of the analyses must be included in the SDG Narrative. 4. A sample, which was analyzed immediately after a high-level sample, displaying concentrations of target compounds between the reporting limit and 5× the reporting limit must be reanalyzed. If the results do not fall within the reporting limit, report only the second analysis.

Table A-5 Volatile Organic Compounds - SW-846 Method 8260B Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Tune Check (50ng BFB)	Every 12 hours.	Ensure correct mass assignment. BFB % relative abundance criteria as specified in method.	Retune. Do not proceed with analysis until tune meets criteria.
Initial calibration	Each time the instrument is set up and when CCCs and SPCCs in the continuing calibration do not meet criteria. 1. Established initially at five concentration levels (six levels for quadratic curve) - low standard at or below reporting limit. 2. Heated purge for low-level soils.	1. Ave RRF for SPCCs must meet method criteria. 2. %RSD for RRFs for each CCC ≤30%. 3. Target non-CCC compounds and surrogate compounds will have %RSD≤15% or generate a calibration curve. The calibration curve must have a correlation coefficient (R) ≥0.99 or a coefficient of determination (R^2) ≥0.99. 4. All target compounds must have an RRF≥0.05, except for the ketones which must have an RRF≥0.01.	1. %RSD>15% require quantitation using a calibration curve. 2. If a target compound does not meet the acceptance criteria (%RSD≤15%, R≥0.99, and R^2 ≥0.99), a new initial calibration must be performed. 3. If SPCC criteria are not met, a new initial calibration must be performed.

Table A-5 Volatile Organic Compounds - SW-846 Method 8260B Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Continuing Calibration Verification	Every 12 hours. Must be at or near the mid-point calibration range for all target compounds, CCCs, SPCCs, and surrogates. Heated purges for low-level soils.	1. RRF for SPCCs must meet method criteria. 2. %D for each CCC, for target non-CCC compounds, and surrogates ≤20%. 3. All target compounds must have an RRF ≥0.05, except for the ketones which must have an RRF ≥0.01. 4. Retention time (RT) for any internal standard within 30 sec of the RT in the mid-point standard of the initial calibration. 5. Area response of any internal standard within -50% to +100% of area in the mid-point standard of the initial calibration.	Correct system, if necessary, and recalibrate. Criteria must be met before sample analysis may begin.
Internal standards	Added to all blanks, standards, samples, and QC samples.	1. Peak area within -50% to +100% of area in associated continuing calibration standard. 2. Retention time (RT) within 30 sec of RT for associated continuing calibration standard.	1. Inspect instrument for malfunctions; correct identified malfunctions, then reanalyze samples. 2. If no instrument malfunction is identified, proceed as follows: i) Reanalyze sample. ii) If reanalysis is out, report both sets of data and note in SDG Narrative. If in, report only second set. 3. If the sample was chosen for the MS/MSD analysis and the MS and/or MSD internal standards are outside limits, then no reanalysis is required.

Table A-5 Volatile Organic Compounds - SW-846 Method 8260B Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Method Blank	1. After each continuing calibration standard (before sample analysis) for low-level analyses. 2. After the initial calibration if samples are to be analyzed immediately following the calibration for low-level analyses. 3. One per extraction batch of ≤20 samples per matrix per day for medium-level analyses.	1. Common laboratory contaminants (acetone, methylene chloride, and 2-butanone) <5×reporting limit. All other target compounds <reporting limit. 2. Must meet internal standard criteria. 3. Must meet surrogate criteria.	Reanalyze to determine if instrument contamination was the cause. If the method blank is compliant upon reanalysis, then reanalyze all samples, unless samples contain >10× amount found in blank or there are no positive results. If the method blank is still noncompliant, reprepare a method blank and all samples (unless samples contain >10× amount found in blank or there are no positive results). If samples are past the holding time or if blank is still out after reanalysis, report both sets of data and notify QAM.
Laboratory Control Sample (LCS)	One per batch of ≤20 samples per matrix per concentration level per day. Must undergo all sample preparative procedures. Must contain all target compounds at concentrations at or near the mid-point of the calibration range.	Limits on Tables A-22, A-23, and A-26.	1. Reanalyze LCS. If the LCS is compliant upon reanalysis, then reanalyze all associated samples (see exception). If still non-compliant, then follow 2 or 3 below. 2. If the samples are within the holding time, then reprepare and reanalyze the LCS and all associated samples (see exception). 3. If samples are past the holding time or if LCS is still non-compliant after reanalysis, report both sets of data and notify QAM. Exception: If LCS recovery is high and there are no positive results (<detection limit) in the associated samples, then address in SDG Narrative and no further action needed.

Table A-5 Volatile Organic Compounds - SW-846 Method 8260B Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One per batch of ≤20 samples per matrix per concentration level per day. Must undergo all sample preparative procedures. Must be spiked with all target compounds at concentrations at or near the mid-point of the calibration range.	Limits on Tables A-22, A-23, and A-26.	1. If recoveries for the spiked compounds are not within limits, check for documentable errors (*e.g.*, calculations and spike preparation). 2. Check unspiked sample results and surrogate recoveries for indications of matrix effects. 3. If no errors are found and the associated LCS is within limits, then sample matrix effects are the most likely cause. Note in SDG Narrative.

Table A-5 Volatile Organic Compounds - SW-846 Method 8260B Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Surrogate Compounds	1. Calibrated and quantitated as target compounds. 2. Added to all standards, blanks, samples, and QC samples.	Limits on Table A-27.	If recovery is not within limits: 1. Check to be sure that there are no errors in calculations, surrogate solutions, and internal standards. Also, check instrument performance. 2. If no problem is found, reprepare and reanalyze the sample. 3. If the reanalysis is within limits and holding times, then report only the reanalysis. 4. If the reanalysis is within limits, but out of holding time, then report both sets of data and note in SDG Narrative.. 5. If the reanalysis is still out of limits, then report both sets of data and note in SDG Narrative.. 6. If the sample was chosen for the MS/MSD analysis, and the MS and/or MSD surrogate recoveries are outside limits, then no reanalysis is required.

Table A-5 Volatile Organic Compounds - SW-846 Method 8260B Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Qualitative/Quantitative Issues	1. If instrument level of any compound in a sample exceeds the instrument level of that compound in the highest level standard, the sample must be diluted to approximately mid-level of the calibration range and reanalyzed. 2. If the concentration of the target analyte that exceeded the calibration range is present in the high level sample and in the sample analyzed immediately after at a level ≤5× reporting limit, then that second sample must be reanalyzed to determine if carryover occurred.	1. The instrument level of all compounds must be within the calibration range for all samples. 2. The sample analyzed immediately after a high-level sample must display concentrations of the high-level target compounds greater than 5× reporting limit.	1. Dilute the sample to bring the level of the highest concentration of target compounds within the calibration range. 2. A sample, which was analyzed immediately after a high-level sample, displaying concentrations of target compounds ≤5× the reporting limit must be reanalyzed. If the results do not agree within the reporting limit, report only the second analysis.

Table A-6 Semivolatile Organic Compounds — SW-846 Method 8270C/US EPA Method 625 LL Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Tune Check (50ng DFTPP)	Every 12 hours.	Ensure correct mass assignment. DFTPP % relative abundance criteria as specified in method.	Retune. Do not proceed with analysis until tune meets criteria.
Initial calibration	Each time the instrument is set up and when CCCs and SPCCs in the calibration do not meet criteria. Established initially at five concentration levels (six levels for quadratic curve) - low standard at or below reporting limit.	1. Ave RRF for each SPCC ≥0.050. 2. %RSD for RRFs for each CCC ≤30%. 3. %RSD for RRFs for all non-CCC target and surrogate compounds ≤15% or generate a calibration curve. 4. The calibration curve must have a correlation coefficient (R)≥0.99 or a coefficient of determination (R^2) ≥0.99. 5. All target compounds must have an RRF≥0.05.	%RSD>15% require quantitation using a calibration curve. If a target compound does not meet the acceptance criteria (%RSD≤15%, R≥0.99, and R^2 ≥0.99), a new initial calibration must be performed. If SPCC criteria are not met, a new initial calibration must be performed.
Continuing Calibration Verification	Every 12 hours. Must be at or near the mid-point calibration range for all target compounds, SPCCs, CCCs, and surrogates.	1. RRF for each SPCC ≥ 0.050. 2. %D for RRFs of each CCC ≤ 20%; for non-CCC target compounds and surrogates ≤20%. 3. All target compounds must have RRFs≥0.05. 4. Retention time (RT) for any internal standard within 30 sec of the RT in the mid-point standard of the initial calibration. 5. Area response of any internal standard within -50% to +100% of area in the mid-point standard of the initial calibration.	Correct system, if necessary, and recalibrate. Criteria must be met before sample analysis may begin.

Table A-6 Semivolatile Organic Compounds — SW-846 Method 8270C/US EPA Method 625 LL Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Internal standards	Added to all blanks, standards, QC samples, and samples.	1. Peak area within -50% to +100% of area in associated continuing calibration standard. 2. Retention time (RT) within 30 sec of RT for associated continuing calibration standard.	1. Inspect instrument for malfunctions; correct identified malfunctions, then reanalyze samples. 2. If no instrument malfunction is identified, proceed as follows: i) Reanalyze sample. ii) If reanalysis is out, report both sets of data. If in, report only second set. 3. If the sample was chosen for the MS/MSD analysis and the MS and/or MSD internal standards are outside limits, then no reanalysis is required.
Method Blank	One per extraction batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures.	1. Target phthalate esters <5×reporting limit. All other target compounds <reporting limit. 2. Must meet internal standard criteria. 3. Must meet surrogate criteria.	Reanalyze to determine if instrument contamination was the cause. If the method blank is compliant upon reanalysis, then reanalyze all samples (unless samples contain >10× amount found in blank or there are no positive results). If the method blank is still noncompliant, reextract and reanalyze all samples, unless samples contain >10× amount found in blank or there are no positive results. If samples are past the holding time or if blank is still out after reanalysis, report both sets of data and notify QAM.

Table A-6 Semivolatile Organic Compounds — SW-846 Method 8270C/US EPA Method 625 LL Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Laboratory Control Sample (LCS)	One per extraction batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures. Must contain all target compounds at concentrations at the mid-point of the calibration range.	Limits on Tables A-22, A-23, and A-26.	1. Reanalyze LCS. If the LCS is compliant upon reanalysis, then reanalyze all associated samples (see exception). If still non-compliant, then follow 2 or 3 below. 2. If the samples are within the holding time, then reextract and reanalyze the LCS and all associated samples (see exception). 3. If samples are past the holding time or if LCS is still non-compliant after reanalysis, report both sets of data and notify QAM. Exception: If LCS recovery is high and there are no positive results (<detection limit) in the associated samples, then address in SDG Narrative and no further action needed.
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One per extraction batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures. Must be spiked with all target compounds at concentrations at or near the mid-point of the calibration range.	Limits on Tables A-22, A-23, and A-26.	1. If recoveries for the spiked compounds are not within limits, check for documentable errors (*e.g.*, calculations and spike preparation). 2. Check unspiked sample results and surrogate recoveries for indications of matrix effects. 3. If no errors are found and the associated LCS are within limits, then sample matrix effects are the most likely cause. Note in SDG Narrative.

Table A-6 Semivolatile Organic Compounds — SW-846 Method 8270C/US EPA Method 625 LL Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Surrogate Compounds	1. Calibrated and quantitated as target compounds. 2. Added to all standards, blanks, samples, and QC samples.	Limits on Table A-27.	If any one recovery acceptance criteria are not within limits: 1. Check to be sure that there are no errors in calculations, surrogate solutions, and internal standards. Also, check instrument performance. 2. If no problem is found, reextract and reanalyze the sample. 3. If the reanalysis is within limits and holding times, then report only the reanalysis. 4. If the reanalysis is within limits, but out of holding time, then report both sets of data. 5. If the reanalysis is still out of limits, then report both sets of data. 6. If the sample was chosen for the MS/MSD analysis, and the MS and/or MSD surrogate recoveries are outside limits, then no reanalysis is required.

Table A-6 Semivolatile Organic Compounds — SW-846 Method 8270C/US EPA Method 625 LL Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Qualitative/Quantitative Issues	1. If instrument level of any compound in a sample exceeds the instrument level of that compound in the highest level standard, the sample must be diluted to approximately mid-level of the calibration range and reanalyzed. 2. If the concentration of the target analyte that exceeded the calibration range is present in the high level sample and in the sample analyzed immediately after at a level greater than the reporting limit but ≤5× reporting limit, then that second sample must be reanalyzed to determine if carryover occurred.	1. The instrument level of all compounds must be within the calibration range for all samples. 2. The sample analyzed immediately after a high-level sample must display concentrations of the high-level target compounds less than the reporting limit or greater than 5× reporting limit.	1. Dilute the sample to bring the level of the highest concentration of target compounds within the calibration range. 2. A sample, which was analyzed immediately after a high-level sample, displaying concentrations of target compounds between the reporting limit and 5× the reporting limit must be reanalyzed. If the results do not agree within the reporting limit, report only the second analysis.

Table A-7 Metals by ICP – SW-846 Method 6010B/US EPA Method 200.7# Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial Calibration and Calibration Verification	Once per 24 hours and each time the instrument is set up. Initial calibration consists, at a minimum, of a blank and one standard. Immediately after instrument calibration, an initial calibration verification (ICV) standard must be analyzed. An initial calibration blank (ICB) is analyzed immediately following the ICV.	Recovery of ICV is within 90-110%. Absolute value of ICB is < reporting limit.	1. Reanalyze ICV. If ICV is still out, terminate analysis, correct problem, and recalibrate instrument. 2. Sample results above the linear range of the instrument require dilution and reanalysis.
Continuing Calibration Verification and Continuing Calibration Blank (CCV/CCB)	At the beginning and end of each analysis run and once per 10 samples or every 2 hours, whichever is more frequent.	Recovery of CCV is within 90-110%. Absolute value of CCB is < reporting limit.	Reanalyze CCV or CCB. If CCV or CCB is still out, terminate analysis, correct problem, and recalibrate instrument. Reanalyze all analytical samples since the last compliant CCV/CCB.
Reporting Limit Standard	At the beginning and end of each analysis run, or a minimum of twice per 8-hour working shift, whichever is more frequent, but not before the CCV.	Recoveries must be within 50-150%.	Terminate analysis, correct problem.
ICP Interference Check Samples (ICSA and ICSAB)	At the beginning and end of each analysis run, or a minimum of twice per 8-hour working shift, whichever is more frequent, but not before the CCV.	Recoveries of ICSA and ICSAB are within 80-120% for the analytes included. Absolute value of the concentrations for analytes not included in ICSA and ICSAB must be less than 2× reporting limit.	If either of the criteria is not met, terminate the analysis, correct the problem, recalibrate the instrument, and reanalyze all project samples and QC samples since last compliant ICSA/ICSAB.

Table A-7 Metals by ICP – SW-846 Method 6010B/US EPA Method 200.7# Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Preparation Blank	One per digestion batch of ≤ 20 samples per matrix per day. Must undergo all sample preparative procedures.	The absolute value of the concentration must be less than the reporting limit of the analyte. Not applicable if sample concentration is >10× blank level or if positive result is reported for the blank but the analyte is not detected in the sample.	Redigest and reanalyze all associated samples.
Laboratory Control Sample (LCS)	One per batch of ≤ 20 samples per matrix per day.	Limits on Tables A-22, A-23, A-24, A-25, and A-26.	Redigest and reanalyze all associated samples.
Pre-Digestion Matrix Spike	One per batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22, A-23, A-24, A-25, and A-26. Not applicable if sample concentration is >4× spike added.	1. Perform a post-digestion spike (except for Ag). 2. Report in SDG Narrative.
Laboratory Duplicate	One per batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22, A-23, A-24, A-25, and A-26.	Report in SDG Narrative.
ICP Serial Dilution (five-fold)	One per batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures.	Within 10% difference if the original sample concentration is ≥50× method detection limit.	Report in SDG Narrative.
Coefficient of Variation: (Metals Only)	All multiple injections/integrations.	±20% CV.	If the concentration is >reporting limit, rerun once. Report the results for the analysis displaying the lower CV.

#Trace ICP may be used, provided the requirements for interference check criteria are met.

Table A-8 Metals by ICP/MS – SW-846 Method 6020/US EPA Method 200.8 Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Mass calibration and resolution checks	Daily before the first initial calibration of the day.	Mass calibration must result in differences less than 0.1 amu from the true value. Resolution must also be verified to be less than 0.9 amu full width at 10% peak height for SW-846 Method 6020 and less than 0.75 amu at 5% peak height for US EPA Method 200.8.	Mass calibration must be within acceptance criteria before instrument is calibrated and any samples are analyzed.
Initial Calibration and Calibration Verification	Once per 24 hours and each time the instrument is set up. Initial calibration consists, at a minimum, of a blank and one standard. Immediately after instrument calibration, an initial calibration verification (ICV) standard must be analyzed. An initial calibration blank (ICB) is analyzed immediately following the ICV.	Recovery of ICV is within 90-110%. Absolute value of ICB is <reporting limit.	1. Reanalyze ICV. If ICV is still out, terminate analysis, correct problem, and recalibrate instrument. 2. Sample results above the linear range of the instrument require dilution and reanalysis.

Table A-8 Metals by ICP/MS – SW-846 Method 6020/US EPA Method 200.8 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Continuing Calibration Verification and Continuing Calibration Blank (CCV/CCB)	At the beginning and end of each analysis run and once per 10 samples or every 2 hours, whichever is more frequent.	Recovery of CCV is within 90-110%. Absolute value of CCB is <reporting limit.	Reanalyze CCV or CCB. If CCV or CCB is still out, terminate analysis, correct problem, and recalibrate instrument. Reanalyze all analytical samples since the last compliant CCV/CCB.
Internal Standards	Intensities of all internal standards must be monitored for every analysis.	The percent relative intensity (%RI) in a sample must be within 60-125% of the response in the associated calibration blank for US EPA Method 200.8 and within 30-120% of the response in the initial calibration standard for SW-846 Method 6020.	Follow SW-846 Method 6020 Section 8.3 or US EPA Method 200.8 Section 9.4.5, as applicable.
Reporting Limit Standard	At the beginning and end of each analysis run, or a minimum of twice per 8-hour working shift, whichever is more frequent, but not before the CCV.	Recoveries must be within 50-150%.	Terminate the analysis, correct the problem.
ICP Interference Check Samples (ICSA and ICSAB)	At the beginning and end of each analysis run, or a minimum of twice per 8-hour working shift, whichever is more frequent, but not before the CCV.	ICSA and ICSAB are within 80-120% recovery for the analytes included. Absolute value of the concentrations for analytes not included in ICSA and ICSAB must be less than 2×reporting limit.	If either of the criteria is not met, terminate the analysis, correct the problem, recalibrate the instrument, and reanalyze all project samples and QC samples since last compliant ICSA/ICSAB.

Table A-8 Metals by ICP/MS – SW-846 Method 6020/US EPA Method 200.8 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Preparation Blank	One per digestion batch of ≤ 20 samples per matrix per day. Must undergo all sample preparative procedures.	The absolute value of the concentration must not exceed the reporting limit of the analyte. Not applicable if sample concentration is >10× blank level or if positive result is reported for the blank but the analyte is not detected in the sample.	Redigest and reanalyze all associated samples.
Pre-Digestion Matrix Spike	One per batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22, A-23, A-24, and A-25. Not applicable if sample concentration is >4× spike added.	1. Perform a post-digestion spike (except for Ag). 2. Report in SDG Narrative.
Laboratory Control Sample (LCS)	One per batch of ≤ 20 samples per matrix per day.	Limits on Tables A-22, A-23, A-24, and A-25.	Redigest and reanalyze all associated samples.

Table A-8 Metals by ICP/MS – SW-846 Method 6020/US EPA Method 200.8 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Laboratory Duplicate	One per batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22, A-23, A-24, and A-25.	Report in SDG Narrative.
ICP Serial Dilution (five-fold)	One per batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures.	Within 10% difference if the original sample concentration is ≥50× method detection limit.	Report in SDG Narrative.

Table A-9 Mercury — SW-846 Methods 7470A and 7471A/US EPA Method 245.1 Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial Calibration and Calibration Verification	Once per 24 hours or each time the instrument is set up. Initial calibration consists, at a minimum, of a blank and five standards (one standard must be at the Reporting Limit). An initial calibration verification (ICV) standard is analyzed immediately following the initial calibration. An initial calibration blank (ICB) is analyzed immediately following the ICV.	Correlation coefficient of ≥ 0.995 for the calibration curve. Recovery of ICV is within 80-120%. Absolute value of ICB is <reporting limit.	1. Reanalyze ICV. If ICV is still out, terminate analysis, correct problem, and recalibrate instrument. 2. Dilute and reanalyze any samples with results above highest standard concentration.
Continuing Calibration Verification and Continuing Calibration Blank (CCV/CCB)	At the beginning and end of each analysis run and once per 10 samples or every 2 hours, whichever is more frequent. The CCV is to be followed immediately by the CCB.	Recovery of CCV is within 80-120%. Absolute value of CCB is < reporting limit.	Reanalyze CCV or CCB. If CCV or CCB is still out, terminate analysis, correct problem, and recalibrate instrument. Reanalyze all analytical samples since the last compliant CCV/CCB.
Reporting Limit Standard	At the beginning and end of each analysis run, or a minimum of twice per 8-hour working shift, whichever is more frequent, but not before the ICV.	Recoveries must be within 50-150%.	Terminate analysis, correct problem.

Table A-9 Mercury — SW-846 Methods 7470A and 7471A/US EPA Method 245.1 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Preparation Blank	One per batch of ≤ 20 samples per matrix per day. Must undergo all sample preparative procedures.	Absolute value of the concentration must be less than the reporting limit of the analyte. Not applicable if sample concentration is >10× blank level or if a positive result is reported for the preparation blank and mercury was not detected in the project sample.	Redigest and reanalyze all associated samples.
Laboratory Control Sample (LCS)	One per batch of ≤ 20 samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22, A-24, A-25, and A-26.	Check calculations and spike preparation for documentable errors. If no errors are noted, redigest and reanalyze all associated samples.
Pre-Digestion Matrix Spike	One per batch of ≤ 20 samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22, A-24, A-25, and A-26. Not applicable if sample concentration is >4× spike added.	Report in SDG Narrative.
Laboratory Duplicate	One per batch of ≤ 20 samples, not to exceed 20 samples of a given matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22, A-24, A-25, and A-26.	Report in SDG Narrative.

Table A-10 Inorganic Anions — US EPA Method 300.0/SW-846 Method 9056 Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial Calibration and Verification	Initial calibration is performed each time the instrument is setup (consisting of, at minimum, one blank and three standards) and verified on each working day. An initial calibration verification (ICV) standard is analyzed immediately after the initial calibration verification. Continuing calibration verifications (CCVs) are analyzed after every tenth sample and at the end of the run.	ICV and CCV within 90-110% true value.	If calibration verification fails criteria, reanalyze ICV/CCV. If criteria are still not met, correct the system, recalibrate the instrument, and reanalyze all samples back to the last acceptable ICV/CCV.
Initial Calibration Blank (ICB)/Continuing Calibration Blank (CCB)	Immediately after each ICV/CCV.	Absolute value of the concentration < reporting limit.	Recalibrate. Re-prepare and reanalyze all samples after last acceptable CCB.
Quality Control Sample (QCS)	Quarterly or as required to meet data-quality needs, must be second source.	90-110% of true value.	Reprepare and reanalyze all associated samples.
Laboratory Reagent Blank (LRB)	One per batch of ≤20 samples. Must undergo all sample preparative procedures.	Absolute value of the concentration < reporting limit.	Reprepare and reanalyze all associated samples.
Laboratory Fortified Blank (LFB)	One per batch of ≤ 20 samples per matrix per day.	Limits on Tables A-22 and A-24.	Reprepare and reanalyze all associated samples.

Table A-10 Inorganic Anions — US EPA Method 300.0/SW-846 Method 9056 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Laboratory Fortified Sample Matrix (LFM)	One per every 10 samples. Must undergo all sample preparative procedures. Fortified concentration must be ≥ background sample concentration and should not be < 4x RL.	Limits on Tables A-22 and A-24. Not applicable if sample concentration is >4× spike added.	Report in SDG Narrative.
Duplicate Analysis	One per batch of ≤20 samples, per day, not to exceed 20 samples of a given matrix.	Limits on Tables A-22 and A-24.	Report in SDG Narrative.
Sample Quantitation	Dilutions must be performed on samples with responses that exceed the calibration range of the instrument.	Appropriate dilutions are made to samples to bring the instrument levels of samples to near the mid-range of the instrument calibration.	If a sample displays a target analyte concentration greater than the calibration range, the sample must be diluted and reanalyzed. If the dilution is deemed excessive (the instrument level is less than the reporting limit after dilution), a more appropriate dilution factor will be used and the sample must be reanalyzed.

Table A-11 Total Organic Carbon – US EPA Method 415.1/Standard Method 5310B Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Multi-Point Calibration Curve (a blank and 5 standards)	Daily prior to sample analysis	R≥0.995	1. Recalibrate. 2. Prepare new standards and recalibrate if still out.
Mid-Range Initial Calibration Verification (ICV)	Immediately after calibration curve. Must be second-source standard.	90 – 110% of true value	1. Reanalyze. Re-prepare and reanalyze if still out. 2. Troubleshoot and recalibrate if still out.
Continuing Calibration Verification (CCV)	Beginning of run, after every 10 samples, and end of run.	90-110% of true value	Recalibrate. Re-prepare and reanalyze all samples after last acceptable CCV.
Initial Calibration Blank (ICB)/ Continuing Calibration Blank (CCB)	Immediately after each ICV/CCV.	Absolute value of the concentration < reporting limit.	Recalibrate. Re-prepare and reanalyze all samples after last acceptable CCB.
Method Blank	One per ≤20 samples per matrix per day. Must undergo all sample preparative procedures.	Absolute value of the concentration < reporting limit.	Reprepare and reanalyze all associated samples.
Laboratory Control Sample	One per batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Table A-22.	Reprepare and reanalyze all associated samples.
Laboratory Duplicate	One per batch of ≤20 samples, per day, not to exceed 20 samples of a given matrix.	Limits on Table A-22.	Report in SDG Narrative.

Table A-11 Total Organic Carbon – US EPA Method 415.1/Standard Method 5310B Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Matrix Spike	One MS per 20 project samples per matrix, per day. Must be spike at a level at or near the mid-point of the calibration range. Must undergo all sample preparative procedures.	Limits on Table A-22. Not applicable if sample concentration is >4× spike added.	Report in SDG Narrative.
Sample Quantitation	Dilutions must be performed on samples with responses that exceed the calibration range of the instrument.	Appropriate dilutions are made to samples to bring the instrument levels of samples to near the mid-range of the instrument calibration.	If a sample displays a target analyte concentration greater than the calibration range, the sample must be diluted and reanalyzed. If the dilution is deemed excessive (the instrument level is less than the reporting limit after dilution), a more appropriate dilution factor will be used and the sample must be reanalyzed.

Table A-12 Total Phosphorus – US EPA Method 365.3 Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Multi-Point Calibration Curve (a blank and 5 standards)	Daily prior to sample analysis	R≥0.995	1. Recalibrate. 2. Prepare new standards and recalibrate if still out.
Mid-Range Initial Calibration Verification (ICV)	Immediately after calibration curve. Must be second-source standard.	90 – 110% of true value	3. Reanalyze. Re-prepare and reanalyze if still out. 4. Troubleshoot and recalibrate if still out.
Continuing Calibration Verification (CCV)	Beginning of run, after every 10 samples, and end of run.	90-110% of true value	Recalibrate. Re-prepare and reanalyze all samples after last acceptable CCV.
Initial Calibration Blank (ICB)/ Continuing Calibration Blank (CCB)	Immediately after each ICV/CCV.	Absolute value of the concentration < reporting limit.	Recalibrate. Re-prepare and reanalyze all samples after last acceptable CCB.
Method Blank	One per ≤20 samples per matrix per day. Must undergo all sample preparative procedures.	Absolute value of the concentration < reporting limit.	Reanalyze all associated samples.
Laboratory Control Sample	One per batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Table A-22.	Reanalyze all associated samples.
Laboratory Duplicate	One per batch of ≤20 samples, per day, not to exceed 20 samples of a given matrix.	Limits on Table A-22.	Report in SDG Narrative.

Table A-12 Total Phosphorus – US EPA Method 365.3 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Matrix Spike	One MS per 20 project samples per matrix, per day. Must be spike at a level at or near the mid-point of the calibration range. Must undergo all sample preparative procedures.	Limits on Table A-22. Not applicable if sample concentration is >4× spike added.	Report in SDG Narrative.
Sample Quantitation	Dilutions must be performed on samples with responses that exceed the calibration range of the instrument.	Appropriate dilutions are made to samples to bring the instrument levels of samples to near the mid-range of the instrument calibration.	If a sample displays a target analyte concentration greater than the calibration range, the sample must be diluted and reanalyzed. If the dilution is deemed excessive (the instrument level is less than the reporting limit after dilution), a more appropriate dilution factor will be used and the sample must be reanalyzed.

Table A-13 Alkalinity – Standard Method 2320B Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Two-Point Calibration of pH Meter With Verification Using Buffers 4, 7, and 10	Daily prior to sample analysis	Buffers 4, 7, and 10 must be within ± 0.05 pH units of true value	1. Recalibrate. 2. Prepare new standards and recalibrate if still out.
Continuing Calibration Verification (CCV)	Beginning of run, after every 10 samples, and end of run.	Buffer 7 must be within ± 0.05 pH units of true value	Recalibrate. Re-prepare and reanalyze all samples after last acceptable CCV.
Method Blank	One per batch of ≤20 samples per day. Must undergo all sample preparative procedures.	< reporting limit.	Reanalyze all associated samples.
Laboratory Control Sample	One per batch of ≤20 samples per day. Must undergo all sample preparative procedures. Must be prepared at a concentration at or near the mid-point of the calibration curve.	Limits on Table A-22.	Reanalyze all associated samples.
Laboratory Duplicate	One per batch of ≤20 samples, per day,.	Limits on Table A-22.	Report in SDG Narrative.

Table A-14 TDS/TS – Standard Methods 2540C and 2540G/US EPA Methods 160.1 and 160.3 Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Method Blank	One per batch of ≤20 samples, per day. Must undergo all sample preparative procedures.	< reporting limit.	Reanalyze all associated samples.
Laboratory Control Sample	One per batch of ≤20 samples per day. Must undergo all sample preparative procedures.	Limits on Tables A-22 and A-23.	Reanalyze all associated samples.
Laboratory Duplicate	One per batch of ≤20 samples, per day,.	Limits on Tables A-22 and A-23.	Report in SDG Narrative.

Table A-15 pH – Standard Method 4500B/US EPA Method 150.1 Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Two-Point Calibration of pH Meter With Verification Using Buffers 4, 7, and 10	Daily prior to sample analysis	Buffers 4, 7, and 10 must be within ± 0.05 pH units of true value	1. Recalibrate. 2. Prepare new standards and recalibrate if still out.
Mid-Range Initial Calibration Verification (ICV)	Immediately after calibration curve. Must be second-source standard.	90 - 110% of true value	1. Reanalyze. Re-digest and reanalyze if still out. 2. Troubleshoot and recalibrate if still out.
Continuing Calibration Verification (CCV)	Beginning of run, after every 10 samples, and end of run.	Buffer 7 must be within ± 0.05 pH units of true value	Recalibrate. Re-prepare and reanalyze all samples after last acceptable CCV.
Laboratory Control Sample (if performed)	One per batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures. Must be prepared at a concentration at or near the mid-point of the calibration curve.	Limits on Table A-22.	Reanalyze all associated samples.
Laboratory Duplicate	One per batch of ≤20 samples, per day, not to exceed 20 samples of a given matrix.	Limits on Table A-22.	Report in SDG Narrative.

Table A-16 Gas Flow Proportional Counting System Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Self-Absorption Curves & Cross-Talk Curves (for gross α and gross β)	Annually. Same matrix and geometry as samples.	Not applicable.	Not applicable..
Efficiency Checks	Daily when detector is utilized.	Less than ±2σ limits or within ±2σ and ±3σ limits.	Less than ±2σ limits–no action. Between 2σ and 3σ –investigate, note warning. Greater than 3σ–detector must not be used; take corrective action.
Background Checks	Daily when detector is utilized.	Less than ±2σ limits or within ±2σ and ±3σ limits.	Less than ±2σ limits–no action. Between 2σ and 3σ –investigate, note warning. Greater than 3σ–detector must not be used; take corrective action.
Method Blank	One per batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures. Do not subtract blank from field and QC samples.	All target analytes <reporting limit.	Recount once (along with all associated samples) to determine if instrument contamination was the cause. If the method blank is still noncompliant, reprepare and reanalyze a new method blank and all associated samples. Exception: If there are no positive results (activity <MDC) in the associated samples, no further action needed.

Table A-16 Gas Flow Proportional Counting System Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Laboratory Control Sample (LCS)	One per batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22, A-23, and A-24.	Recount once (along with all associated samples) to determine if instrumental conditions or analytical preparation was the cause. If the LCS is still noncompliant, reprepare and reanalyze a new LCS and all associated samples. Exception: If the LCS recovery is high and there are no positive results (activity <MDC) in the associated samples, then address in SDG Narrative; no further action needed.
Matrix Spike (if applicable)	One per batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22 and A-23.	If LCS is acceptable, then report in the SDG Narrative that there was probable matrix interference.
Laboratory or Matrix Duplicate (if applicable)	One per batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22, A-23, and A-24.	If LCS is acceptable, then report in the SDG Narrative that there was probable matrix interference.

Table A-16 Gas Flow Proportional Counting System Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Chemical Yield (Carrier/Tracer Recovery, if applicable)	Added to all blanks, samples, and QC samples.	Limits on Table A-28.	If yield is not within limits: 1. Recount (or reweigh if yield is determined gravimetrically) once to determine if instrumental conditions or analytical preparation was the cause. 2. If yield still noncompliant, reprepare and reanalyze the sample.
Quantitative Issues		Sample density on the planchet area should be no more than 5 mg/cm^2 for alpha and no more than 10 mg/cm^2 for beta.	Reprepare samples using a smaller aliquot.

Table A-17 Alpha Spectroscopy Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Energy Calibration Check	Monthly.	Less than ±2σ limits or within ±2σ and ±3σ limits.	Less than ±2σ limits–no action. Between 2σ and 3σ –investigate, note warning. Greater than 3σ–detector must not be used; take corrective action.
Efficiency Check	Monthly.	Less than ±2σ limits or within ±2σ and ±3σ limits.	Less than ±2σ limits–no action. Between 2σ and 3σ –investigate, note warning. Greater than 3σ–detector must not be used; take corrective action.
Background Check	Weekly.	Less than ±2σ limits or within ±2σ and ±3σ limits.	Less than ±2σ limits–no action. Between 2σ and 3σ –investigate, note warning. Greater than 3σ–detector must not be used; take corrective action.
Resolution Check (FWHM)	Monthly.	Less than ±2σ limits or within ±2σ and ±3σ limits.	Less than ±2σ limits–no action. Between 2σ and 3σ –investigate, note warning. Greater than 3σ–detector must not be used; take corrective action.

Table A-17 Alpha Spectroscopy Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Method Blank	One per batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures. Do not subtract blank from field and QC samples	Target analytes <reporting limit.	Recount once (along with all associated samples) to determine if instrument contamination was the cause. If the method blank is still noncompliant, reprepare and reanalyze a new method blank and all associated samples. Exception: If there are no positive results (activity <MDC) in the associated samples, no further action needed.
Laboratory Control Sample (LCS)	One per batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22, A-23, and A-24.	Recount once (along with all associated samples) to determine if instrumental conditions or analytical preparation was the cause. If the LCS is still noncompliant, reprepare and reanalyze a new LCS and all associated samples. Exception: If the LCS recovery is high and there are no positive results (activity <MDC) in the associated samples, then address in SDG Narrative; no further action needed.

Table A-17 Alpha Spectroscopy Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Matrix Spike (if applicable)	One per batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22 and A-23.	If LCS is acceptable, then report in the SDG Narrative that there was probable matrix interference.
Laboratory or Matrix Duplicate (if applicable)	One per batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22, A-23, and A-24.	If LCS is acceptable, then report in the SDG Narrative that there was probable matrix interference.
Chemical Yield (Tracer Recovery)	Added to all blanks, samples, and QC samples.	Limits on Table A-28.	If yield is not within limits: 1. Recount once to determine if instrumental conditions or analytical preparation was the cause. 2. If yield still noncompliant, reprepare and reanalyze the sample.

Table A-18 Alpha Scintillation Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Instrument Performance Check (gross count of a known level)	Daily when detector is utilized.	Less than ±2σ limits or within ±2σ and ±3σ limits.	Less than ±2σ limits–no action. Between 2σ and 3σ –investigate, note warning. Greater than 3σ–detector must not be used; take corrective action.
Background Check	Daily when instrument is utilized.	Less than ±2σ limits or within ±2σ and ±3σ limits.	Less than ±2σ limits–no action. Between 2σ and 3σ –investigate, note warning. Greater than 3σ–detector must not be used; take corrective action.
Method Blank	One per batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures. Do not subtract blank from field and QC samples	Target analytes <reporting limit.	Recount once (along with all associated samples) to determine if instrument contamination was the cause. If the method blank is still noncompliant, reprepare and reanalyze a new method blank and all associated samples. Exception: If there are no positive results (activity <MDC) in the associated samples, no further action needed.

Table A-18 Alpha Scintillation Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Laboratory Control Sample (LCS)	One per batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22 and A-24.	Recount once (along with all associated samples) to determine if instrumental conditions or analytical preparation was the cause. If the LCS is still noncompliant, reprepare and reanalyze a new LCS and all associated samples. Exception: If the LCS recovery is high and there are no positive results (activity <MDC) in the associated samples, then address in SDG Narrative; no further action needed.
Matrix Spike (if applicable)	One per batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Table A-22.	If LCS is acceptable, then report in the SDG Narrative that there was probable matrix interference.
Laboratory or Matrix Duplicate (if applicable)	One per batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Tables A-22 and A-24.	If LCS is acceptable, then report in the SDG Narrative that there was probable matrix interference.
Chemical Yield (Carrier/Tracer Recovery, if applicable)	Added to all blanks, samples, and QC samples.	Limits on Table A-28.	If yield is not within limits: 1. Recount once to determine if instrumental conditions or analytical preparation was the cause. 2. If yield still noncompliant, reprepare and reanalyze the sample.

Table A-19 Polyaromatic Hydrocarbons (PAH) — SW-846 Method 8270C by Selective Ion Monitoring (SIM) Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial calibration	Each time the instrument is set up and when CCCs in the calibration do not meet criteria. Established initially at five concentration levels (six levels for quadratic curve) - low standard at or below reporting limit.	4. %RSD for RFs for each CCC ≤30%. 5. %RSD for RFs for all non-CCC target and surrogate compounds ≤15% or generate a calibration curve. 6. The calibration curve must have a correlation coefficient (R)≥0.99 or a coefficient of determination (R^2) ≥0.99.	%RSD>15% require quantitation using a calibration curve. If a target compound does not meet the acceptance criteria (%RSD≤15%, R≥0.99, and R^2 ≥0.99), a new initial calibration must be performed.
Retention Time (RT) Windows	1. Established at ±3-sigma of the mean RT of each compound determined over 72 hours (if window is too narrow, use default windows per SW-846 Method 8000B [Section 7.6]). Must be established whenever a new column is installed. 2. Recentered daily based on RT of each of the compounds in the CCV.	Refer to Frequency column (left) regarding RT window Acceptance Criteria. RT windows for quantitation peaks of target compounds must not overlap. Recentering windows is permitted once per 24 hours.	Adjust system and recalibrate.
Continuing Calibration Verification	Every 12 hours. Must be at or near the mid-point calibration range for all target compounds, CCCs, and surrogates.	6. %D for RFs of each CCC ≤ 20%; for non-CCC target compounds and surrogates ≤20%. 7. Retention time (RT) for any internal standard within 30 sec of the RT in the mid-point standard of the initial calibration. 8. Area response of any internal standard within -50% to +100% of area in the mid-point standard of the initial calibration.	Correct system, if necessary, and recalibrate. Criteria must be met before sample analysis may begin.

Table A-19 Polyaromatic Hydrocarbons (PAH) — SW-846 Method 8270C by Selective Ion Monitoring (SIM) Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Internal standards	Added to all blanks, standards, QC samples, and samples.	1. Peak area within -50% to +100% of area in associated continuing calibration standard. 2. Retention time (RT) within 30 sec of RT for associated continuing calibration standard.	1. Inspect instrument for malfunctions; correct identified malfunctions, then reanalyze samples. 2. If no instrument malfunction is identified, proceed as follows: iii) Reanalyze sample. iv) If reanalysis is out, report both sets of data. If in, report only second set. 3. If the sample was chosen for the MS/MSD analysis and the MS and/or MSD internal standards are outside limits, then no reanalysis is required.
Method Blank	One per extraction batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures.	1. Target phthalate esters <5×reporting limit. All other target compounds <reporting limit. 2. Must meet internal standard criteria. 3. Must meet surrogate criteria.	Reanalyze to determine if instrument contamination was the cause. If the method blank is compliant upon reanalysis, then reanalyze all samples (unless samples contain >10× amount found in blank or there are no positive results). If the method blank is still noncompliant, reextract and reanalyze all samples, unless samples contain >10× amount found in blank or there are no positive results. If samples are past the holding time or if blank is still out after reanalysis, report both sets of data and notify QAM.

Table A-19 Polyaromatic Hydrocarbons (PAH) — SW-846 Method 8270C by Selective Ion Monitoring (SIM) Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Laboratory Control Sample (LCS)	One per extraction batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures. Must contain all target compounds at concentrations at the mid-point of the calibration range.	Limits on Tables A-22 and A-23.	1. Reanalyze LCS. If the LCS is compliant upon reanalysis, then reanalyze all associated samples (see exception). If still non-compliant, then follow 2 or 3 below. 2. If the samples are within the holding time, then reextract and reanalyze the LCS and all associated samples (see exception). 3. If samples are past the holding time or if LCS is still non-compliant after reanalysis, report both sets of data and notify QAM. Exception: If LCS recovery is high and there are no positive results (<detection limit) in the associated samples, then address in SDG Narrative and no further action needed.
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One per extraction batch of 20 or fewer samples per matrix per day. Must undergo all sample preparative procedures. Must be spiked with all target compounds at concentrations at or near the mid-point of the calibration range.	Limits on Tables A-22 and A-23.	1. If recoveries for the spiked compounds are not within limits, check for documentable errors (*e.g.*, calculations and spike preparation). 2. Check unspiked sample results and surrogate recoveries for indications of matrix effects. 3. If no errors are found and the associated LCS are within limits, then sample matrix effects are the most likely cause. Note in SDG Narrative.

Table A-19 Polyaromatic Hydrocarbons (PAH) — SW-846 Method 8270C by Selective Ion Monitoring (SIM) Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Surrogate Compounds	1. Calibrated and quantitated as target compounds. 2. Added to all standards, blanks, samples, and QC samples.	Limits on Table A-27.	If any one recovery acceptance criteria are not within limits: 1. Check to be sure that there are no errors in calculations, surrogate solutions, and internal standards. Also, check instrument performance. 2. If no problem is found, reextract and reanalyze the sample. 3. If the reanalysis is within limits and holding times, then report only the reanalysis. 4. If the reanalysis is within limits, but out of holding time, then report both sets of data. 5. If the reanalysis is still out of limits, then report both sets of data. 6. If the sample was chosen for the MS/MSD analysis, and the MS and/or MSD surrogate recoveries are outside limits, then no reanalysis is required.

Table A-19 Polyaromatic Hydrocarbons (PAH) — SW-846 Method 8270C by Selective Ion Monitoring (SIM) Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Qualitative/Quantitative Issues	1. If instrument level of any compound in a sample exceeds the instrument level of that compound in the highest level standard, the sample must be diluted to approximately mid-level of the calibration range and reanalyzed. 2. If the concentration of the target analyte that exceeded the calibration range is present in the high level sample and in the sample analyzed immediately after at a level greater than the reporting limit but ≤5× reporting limit, then that second sample must be reanalyzed to determine if carryover occurred.	1. The instrument level of all compounds must be within the calibration range for all samples. 2. The sample analyzed immediately after a high-level sample must display concentrations of the high-level target compounds less than the reporting limit or greater than 5× reporting limit.	1. Dilute the sample to bring the level of the highest concentration of target compounds within the calibration range. 2. A sample, which was analyzed immediately after a high-level sample, displaying concentrations of target compounds between the reporting limit and 5× the reporting limit must be reanalyzed. If the results do not agree within the reporting limit, report only the second analysis.

Table A-20 Mercury —US EPA Method 1631E Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial Calibration	Daily and each time the instrument is set up. The calibration must include at least three calibration blanks (system/subtraction/reagent blanks) and six standards. The lowest calibration point must be the reporting limit.	The RSD must be ≤15% and the recovery of the lowest standard must be 75-125%.	If RSD>15% or recovery of the lowest standard outside 75-125%, a new initial calibration must be performed.
Quality Control Sample/ Initial Calibration Verification (QCS/ICV) (second source standard) and Initial Calibration Blank (ICB)	A QCS/ICV standard is analyzed immediately following the initial calibration. An ICB is analyzed immediately following the QCS/ICV.	Recovery of QCS/ICV within 80-120%. Absolute value of ICB <reporting limit.	If QSC/ICV or ICB fail to meet criteria, terminate analysis, correct problem, and recalibrate instrument.
Ongoing Precision and Recovery/Continuing Calibration Verification(OPR/CCV) and Continuing Calibration Blank (CCB)	At the beginning and end of each analysis run and once per 10 samples. The CCV is to be followed immediately by the CCB.	For accuracy, use recovery limits of 77-123%. Absolute value of CCB is < reporting limit.	If OPR/CCV or CCB fail to meet criteria, terminate analysis, and correct problem. Reanalyze all analytical samples since the last compliant OPR/CCV/CCB.
Method Blank	One per batch of ≤ 20 samples per matrix per day. Must undergo all sample preparative procedures.	Absolute value of the concentration must be less than the reporting limit of the analyte. Not applicable if sample concentration is >20× blank level or if a positive result is reported for the method blank and mercury is not detected in the project sample.	Reprepare and reanalyze all associated samples.

Table A-20 Mercury —US EPA Method 1631E Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Laboratory Control Sample (LCS)	One per batch of ≤ 20 samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Table A-23.	Check calculations and spike preparation for documentable errors. If no errors are noted, reprepare and reanalyze all associated samples. Exception: If LCS recovery is high and there are no positive results (<detection limit) in the associated samples, then address in SDG Narrative and no further action needed.
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One pair per batch of 10 samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Table A-23. Not applicable if sample concentration is >4× spike added.	If LCS is acceptable, report in SDG Narrative. If LCS is outside limits, reprepare and reanalyze batch.
Sample Quantitation	Dilutions must be performed on samples with responses that exceed the calibration range of the instrument.	Appropriate dilutions are made to samples to bring the instrument levels of samples to near the mid-range of the instrument calibration.	If a sample displays a target analyte concentration greater than the calibration range, the sample must be diluted and reanalyzed. If the dilution is deemed excessive (the instrument level is less than the reporting limit after dilution), a more appropriate dilution factor will be used and the sample must be reanalyzed.

Table A-21 Fluoride — US EPA Method 340.2 Quality Control Requirements			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Initial Calibration and Verification	Initial calibration is performed each time the instrument is setup and verified on each working day. An initial calibration verification (ICV) standard is analyzed immediately after the initial calibration verification. Continuing calibration verifications (CCVs) are analyzed after every tenth sample and at the end of the run.	ICV and CCV within 90-110% true value.	If calibration verification fails criteria, reanalyze ICV/CCV. If criteria are still not met, correct the system, recalibrate the instrument, and reanalyze all samples back to the last acceptable ICV/CCV.
Initial Calibration Blank (ICB)/Continuing Calibration Blank (CCB)	Immediately after each ICV/CCV.	Absolute value of the concentration < reporting limit.	Recalibrate. Re-prepare and reanalyze all samples after last acceptable CCB.
Method Blank	One per ≤20 samples per matrix per day. Must undergo all sample preparative procedures.	Absolute value of the concentration < reporting limit.	Reprepare and reanalyze all associated samples.
Laboratory Control Sample	One per batch of ≤20 samples per matrix per day. Must undergo all sample preparative procedures.	Limits on Table A-25.	Reprepare and reanalyze all associated samples.

Table A-21 Fluoride — US EPA Method 340.2 Quality Control Requirements - Continued			
Quality Control Item	**Frequency**	**Acceptance Criteria**	**Corrective Action**
Matrix Spike	One MS per 20 project samples per matrix, per day. Must be spike at a level at or near the mid-point of the calibration range. Must undergo all sample preparative procedures.	Limits on Table A-25. Not applicable if sample concentration is >4× spike added.	Report in SDG Narrative.
Laboratory Duplicate	One per batch of ≤20 samples, per day, not to exceed 20 samples of a given matrix.	Limits on Table A-25.	Report in SDG Narrative.
Sample Quantitation	Dilutions must be performed on samples with responses that exceed the calibration range of the instrument.	Appropriate dilutions are made to samples to bring the instrument levels of samples to near the mid-range of the instrument calibration.	If a sample displays a target analyte concentration greater than the calibration range, the sample must be diluted and reanalyzed. If the dilution is deemed excessive (the instrument level is less than the reporting limit after dilution), a more appropriate dilution factor will be used and the sample must be reanalyzed.

Table A-22 Aqueous Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Benzene	8260B	60 - 125	20	65 - 120
Bromobenzene	8260B	65 - 125	20	70 - 120
Bromochloromethane	8260B	60 - 135	25	65 - 130
Bromodichloromethane	8260B	65 - 135	20	65 - 135
Bromoform	8260B	50 - 135	25	50 - 130
n-Butylbenzene	8260B	65 - 135	20	70 - 125
sec-Butylbenzene	8260B	65 - 125	20	70 - 125
tert-Butylbenzene	8260B	65 - 130	20	70 - 125
Carbon tetrachloride	8260B	65 - 140	25	65 - 140
Chlorobenzene	8260B	70 - 125	20	70 - 125
Chloroethane	8260B	50 - 140	25	55 - 140
2-Chlorotoluene	8260B	65 - 135	20	70 - 125
4-Chlorotoluene	8260B	65 - 135	20	70 - 125
Chloroform	8260B	65 - 135	20	65 - 130
Chloromethane	8260B	35 - 140	25	40 - 140
1,2-Dibromo-3-chloropropane	8260B	40 - 150	30	45 - 135
Dibromochloromethane	8260B	60 - 140	25	65 - 140
1,2-Dibromoethane	8260B	65 - 130	25	70 - 125
Dibromomethane	8260B	65 - 130	25	70 - 125
1,3-Dichlorobenzene	8260B	70 - 125	20	70 - 125
1,4-Dichlorobenzene	8260B	70 - 125	20	70 - 125
Dichlorodifluoromethane	8260B	70 - 125	20	70 - 125
1,1-Dichloroethane	8260B	60 - 130	20	65 - 130
1,2-Dichloroethane	8260B	60 - 140	20	60 - 140
1,1-Dichloroethene	8260B	60 - 135	20	70 - 130
cis-1,2-Dichloroethene	8260B	60 - 130	20	65 - 125
trans-1,2-Dichloroethene	8260B	60 - 135	20	65 - 130
Dichlorofluoromethane	8260B	60 - 125	20	65 - 125
1,2-Dichloropropane	8260B	60 - 125	20	65 - 125
1,3-Dichloropropane	8260B	60 - 135	25	65 - 125
2,2-Dichloropropane	8260B	60 - 145	25	60 - 145
1,1-Dichloropropene	8260B	65 - 135	20	70 - 130
Ethylbenzene	8260B	65 - 130	20	70 - 125
Hexachlorobutadiene	8260B	60 - 135	20	60 - 135
Isopropylbenzene	8260B	65 - 130	20	70 - 125
p-Isopropyltoluene	8260B	65 - 130	20	70 - 125
Methylene chloride	8260B	55 - 130	20	60 - 130
Naphthalene	8260B	45 - 145	30	50 - 140

Table A-22 Aqueous Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
n-Propylbenzene	8260B	65 - 130	20	70 - 125
Styrene	8260B	45 - 145	30	70 - 130
tert-butyl methyl ether	8260B	45 - 145	30	70 - 130
1,1,2,2-Tetrachloroethane	8260B	55 - 140	30	55 - 130
1,1,2,2-Tetrachloroethene	8260B	60 - 130	20	65 - 125
1,1,1,2-Tetrachloroethane	8260B	65 - 140	20	70 - 135
Toluene	8260B	65 - 125	20	70 - 125
1,2,3-Trichlorobenzene	8260B	55 - 135	20	60 - 130
1,2,4-Trichlorobenzene	8260B	60 - 135	20	65 - 135
1,1,1-Trichloroethane	8260B	65 - 140	20	65 - 135
1,1,2-Trichloroethane	8260B	60 - 130	25	65 - 125
Trichloroethene	8260B	60 - 125	20	70 - 125
1,2,3-Trichloropropane	8260B	50 - 135	30	55 - 130
1,2,4-Trimethylbenzene	8260B	55 - 130	25	70 - 125
1,3,5-Trimethylbenzene	8260B	65 - 130	20	70 - 125
Vinyl chloride	8260B	40 - 135	30	50 - 130
Xylene (total)	8260B	60 - 130	20	70 - 125
o-Xylene	8260B	60 - 130	20	70 - 125
m-Xylene	8260B	60 - 130	20	70 - 125
p-Xylene	8260B	60 - 130	20	70 - 125
Diesel (C12-C23)-TPH	8015B	40 - 120	30	40 - 120
Motor Oil (C23-C40)-TPH	8015B	40 - 120	30	40 - 120
Gasoline (C4-C12)-TPH	8015B	60 -145	20	65 - 140
2-Chlorophenol	625 LL	45 - 120	25	45 - 120
4-Chloro-3-methylphenol	625 LL	60 - 120	25	60 - 120
2,4-Dichlorophenol	625 LL	55 - 120	25	55 - 120
2,4-Dimethylphenol	625 LL	40 - 120	25	40 - 120
2,4-Dintrophenol	625 LL	40 - 120	25	40 - 120
4,6-Dinitro-o-cresol	625 LL	50 - 120	25	50 - 120
2-Methylphenol	625 LL	45 - 120	25	45 - 120
3-Methylphenol	625 LL	50 - 120	25	50 - 120
4-Methylphenol	625 LL	50 - 120	25	50 - 120
2-Nitrophenol	625 LL	50 - 120	25	50 - 120
4-Nitrophenol	625 LL	45 - 120	30	45 - 120
Pentachlorophenol	625 LL	50 - 120	25	50 - 120
Phenol	625 LL	40 - 120	25	45 - 120
2,4,5-Trichlorophenol	625 LL	55 - 120	30	55 - 120
2,4,6-Trichlorophenol	625 LL	55 - 120	30	55 - 120

Table A-22 Aqueous Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Benzoic acid	625 LL	25 - 125	30	25 - 120
4-Bromophenyl phenyl ether	625 LL	60 - 120	25	60 - 120
Butyl benzyl phthalate	625 LL	55 - 130	25	55 - 130
2-Chloronaphthalene	625 LL	60 - 120	20	60 - 120
4-Chloroaniline	625 LL	55 - 120	25	55 - 120
Carbazole	625 LL	55 - 125	20	55 - 125
bis(2-Chloroethoxy)methane	625 LL	50 - 120	25	55 - 120
bis(2-Chloroethyl)ether	625 LL	50 - 120	25	50 - 120
bis(2-Chloroisopropyl)ether	625 LL	45 - 120	25	45 - 120
4-Chlorophenyl phenyl ether	625 LL	65 - 120	25	65 - 120
2,4-Dinitrotoluene	625 LL	65 - 120	25	65 - 120
2,6-Dinitrotoluene	625 LL	65 - 120	20	65 - 120
3,3′-Dichlorobenzidine	625 LL	45 - 135	25	45 - 135
Dibenzofuran	625 LL	65 - 120	25	65 - 120
1,2-Dichlorobenzene	625 LL	40 - 120	25	40 - 120
1,3-Dichlorobenzene	625 LL	35 - 120	25	35 - 120
1,4-Dichlorobenzene	625 LL	35 - 120	25	35 - 120
di-*n*-Butyl phthalate	625 LL	60 - 125	25	60 - 125
di-*n*-Octyl phthalate	625 LL	65 - 135	20	65 - 135
Diethyl phthalate	625 LL	55 - 120	30	55 - 120
Dimethyl phthalate	625 LL	30 - 120	30	30 - 120
bis(2-Ethylhexyl)phthalate	625 LL	65 - 130	25	65 - 130
Hexachlorobenzene	625 LL	60 - 120	25	60 - 120
Hexachlorobutadiene	625 LL	40 - 120	25	40 - 120
Hexachlorocyclopentadiene	625 LL	25 - 120	30	25 - 120
Hexachloroethane	625 LL	35 - 120	25	35 - 120
Isophorone	625 LL	50 - 120	25	50 - 120
2-Methylnaphthalene	625 LL	55 - 120	20	55 - 120
2-Nitroaniline	625 LL	65 - 120	25	65 - 120
3-Nitroaniline	625 LL	60 - 120	25	60 - 120
4-Nitroaniline	625 LL	55 - 125	25	55 - 125
Nitrobenzene	625 LL	55 - 120	25	55 - 120
N-Nitroso-di-*n*-propylamine	625 LL	45 - 120	25	45 - 120
N-Nitrosodiphenylamine	625 LL	60 - 120	25	60 - 120
1,2,4-Trichlorobenzene	625 LL	45 - 120	20	45 - 120
Acenaphthene	8270C SIM	60 - 120	25	60 - 120
Acenaphthylene	8270C SIM	60 - 120	25	60 – 120
Anthracene	8270C SIM	65 - 120	25	65 - 120

Table A-22 Aqueous Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Benzo(a)anthracene	8270C SIM	65 - 120	20	65 - 120
Benzo(a)pyrene	8270C SIM	55 - 130	25	55 - 130
Benzo(b)fluoranthene	8270C SIM	55 - 125	25	55 - 125
Benzo(g,h,i)perylene	8270C SIM	45 - 135	30	45 - 135
Benzo(k)fluoranthene	8270C SIM	55 - 125	30	50 - 125
Chrysene	8270C SIM	65 - 120	25	65 - 120
Dibenzo(a,h)anthracene	8270C SIM	45 - 135	30	50 - 135
Fluoranthene	8270C SIM	60 - 120	25	60 - 120
Fluorene	8270C SIM	65 - 120	25	65 - 120
Indeno(1,2,3-cd)pyrene	8270C SIM	40 - 135	30	45 - 135
Naphthalene	8270C SIM	55 - 120	25	55 - 120
Phenanthrene	8270C SIM	65 - 120	25	65 - 120
Pyrene	8270C SIM	55 - 125	25	55 - 125
alpha-BHC	8081A LL	NA	NA	NA
beta-BHC	8081A LL	NA	NA	NA
gamma-BHC (Lindane)	8081A LL	11 - 142	49	63 - 123
delta-BHC	8081A LL	NA	NA	NA
Heptachlor	8081A LL	59 - 118	51	65 - 127
Aldrin	8081A LL	59 - 116	50	69 - 121
Heptachlor epoxide	8081A LL	NA	NA	NA
Endosulfan I	8081A LL	NA	NA	NA
Dieldrin	8081A LL	58 - 126	36	76 - 119
Endrin aldehyde	8081A LL	NA	NA	NA
Endrin	8081A LL	58 - 131	36	70 - 125
Endosulfan II	8081A LL	NA	NA	NA
4,4′- DDD	8081A LL	NA	NA	NA
Endosulfan sulfate	8081A LL	NA	NA	NA
4,4′-DDT	8081A LL	10 - 156	53	62 - 120
4,4′-DDE	8081A LL	NA	NA	NA
Methoxychlor	8081A LL	NA	NA	NA
Endrin ketone	8081A LL	NA	NA	NA
alpha-Chlordane	8081A LL	NA	NA	NA
gamma-Chlordane	8081A LL	NA	NA	NA
Toxaphene	8081A LL	NA	NA	NA
Aroclor-1016	8082 LL	43 - 112	35	60 - 110
Aroclor-1221	8082 LL	NA	NA	NA
Aroclor-1232	8082 LL	NA	NA	NA
Aroclor-1242	8082 LL	NA	NA	NA

Table A-22 Aqueous Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Aroclor-1248	8082 LL	NA	NA	NA
Aroclor-1254	8082 LL	50 - 150	35	50 - 150
Aroclor-1260	8082 LL	44 - 121	31	60 - 111
2,4,5-T	8151A	40 - 160	40	50 - 150
2,4-D	8151A	60 - 140	40	60 - 140
2,4-DB	8151A	40 - 160	40	59 - 143
Dalapon	8151A	60 - 140	40	60 - 140
Dichlorprop	8151A	60 - 140	40	60 - 140
Dicamba	8151A	60 - 140	40	60 - 140
Dinoseb	8151A	40 - 160	40	40 - 160
MCPA	8151A	40 - 160	40	60 - 140
MCPP	8151A	40 - 160	40	60 - 140
Silvex	8151A	40 - 160	40	60 - 140
Aluminum	6010B	75 - 125	20	80 - 120
Aluminum	200.7	70 - 130	20	85 - 115
Antimony	6020	75 - 125	20	80 - 120
Antimony	200.8	70 - 130	20	85 - 115
Arsenic	6020	75 - 125	20	80 - 120
Arsenic	200.8	70 - 130	20	85 - 115
Barium	6020	75 - 125	20	80 - 120
Barium	200.8	70 - 130	20	85 - 115
Beryllium	6020	75 - 125	20	80 - 120
Beryllium	200.8	70 - 130	20	85 - 115
Boron	6010B	75 - 125	20	80 - 120
Boron	200.7	70 - 130	20	85 - 115
Cadmium	6020	75 - 125	20	80 - 120
Cadmium	200.8	70 - 130	20	85 - 115
Calcium	6010B	75 - 125	20	80 - 120
Calcium	200.7	70 - 130	20	85 - 115
Chromium	6020	75 - 125	20	80 - 120
Chromium	200.8	70 - 130	20	85 - 115
Cobalt	6020	75 - 125	20	80 - 120
Cobalt	200.8	70 - 130	20	85 - 115
Copper	6020	75 - 125	20	80 - 120
Copper	200.8	70 - 130	20	85 - 115
Iron	6010B	75 - 125	20	80 - 120
Iron	200.7	70 - 130	20	85 - 115
Lead	6020	75 - 125	20	80 - 120

Table A-22 Aqueous Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Lead	200.8	70 - 130	20	85 - 115
Lithium	200.8	70 - 130	20	85 - 115
Magnesium	6010B	75 - 125	20	80 - 120
Magnesium	200.7	70 - 130	20	85 - 115
Manganese	6020	75 - 125	20	80 - 120
Manganese	200.8	70 - 130	20	85 - 115
Mercury	7470A	75 - 120	20	90 - 115
Mercury	245.1	70 - 130	20	85 - 115
Molybdenum	6020	75 - 125	20	80 - 120
Molybdenum	200.8	70 - 130	20	85 - 115
Nickel	6020	75 - 125	20	80 - 120
Nickel	200.8	70 - 130	20	85 - 115
Phosphorus	200.7	70 - 130	20	85 - 115
Potassium	6010B	75 - 125	20	80 - 120
Potassium	200.7	70 - 130	20	85 - 115
Selenium	6020	75 - 125	20	80 - 120
Selenium	200.8	70 - 130	20	85 - 115
Silicon	200.7	70 - 130	20	85 - 115
Silver	6020	75 - 125	20	80 - 120
Silver	200.8	70 - 130	20	85 - 115
Sodium	6010B	75 - 125	20	80 - 120
Sodium	200.7	70 - 130	20	85 - 115
Strontium	200.7	70 - 130	20	85 - 115
Thallium	6020	75 - 125	20	80 - 120
Thallium	200.8	70 - 130	20	85 - 115
Thorium	200.8	70 - 130	20	85 - 115
Tin	200.7	70 - 130	20	85 - 115
Titanium	200.7	70 - 130	20	85 - 115
Uranium	200.8	70 - 130	20	85 - 115
Vanadium	6020	75 - 125	20	80 - 120
Vanadium	200.8	70 - 130	20	85 - 115
Zinc	6020	75 - 125	20	80 - 120
Zinc	200.8	70 - 130	20	85 - 115
Chloride	300.0	80 - 120	20	90 - 110
Fluoride	300.0	80 - 120	20	90 - 110
Nitrate	300.0	80 - 120	20	90 – 110
Nitrite	300.0	80 - 120	20	90 – 110
Nitrate/Nitrite	300.0	80 - 120	20	90 - 110

Table A-22 Aqueous Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Sulfate	300.0	80 - 120	20	90 - 110
Phosphate (ortho)	300.0	80 - 120	20	90 - 110
Phosphorus, total	365.3	65 - 130	15	80 – 120
Alkalinity, Total	2320B	NA	20	80 – 120
Alkalinity, Bicarbonate	2320B	NA	20	80 – 120
Alkalinity, Carbonate	2320B	NA	20	80 – 120
Alkalinity, Hydroxide	2320B	NA	20	80 – 120
pH	150.1	NA	5	80 – 120
pH	4500B	NA	5	80 – 120
TDS	160.1	NA	10	90 - 110
TDS	2540C	NA	10	90 - 110
TOC	415.1	80 - 120	20	90 - 110
TOC	5310B	80 - 120	20	90 - 110
TS	160.3	NA	10	90 - 110
Gross α	900.0/00-02	70-130	RPD<20 or RER< 2	80-120
Gross β	900.0	70-130	RPD<20 or RER< 2	80-120
Radium-226	903.0	70-130	RPD<20 or RER< 2	80-120
Radium-228	904.0	70-130	RPD<20 or RER< 2	80-120
Thorium-228	HASL 300	70-130	RPD<20 or RER< 2	80-120
Thorium-230	HASL 300	70-130	RPD<20 or RER< 2	80-120
Thorium-232	HASL 300	70-130	RPD<20 or RER< 2	80-120
Uranium-234	HASL 300	70-130	RPD<20 or RER< 2	80-120
Uranium-235	HASL 300	70-130	RPD<20 or RER< 2	80-120
Uranium-238	HASL 300	70-130	RPD<20 or RER< 2	80-120
Total Uranium	Calculated	NA	NA	NA

Notes:
NA Not Applicable

a - The limits presented for these QC analyses are laboratory-derived limits. These limits will periodically be updated; however, the updated limits are not expected to be significantly different than those herein. Laboratory corrective actions will be taken based on the current laboratory-derived limits.

b - Precision limit for matrix spike/matrix spike duplicate, laboratory duplicate, or laboratory control sample/ laboratory control sample duplicate analyses.

Table A-23 Soil/Sediment Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Benzene	5035A-8260B	65 - 130	20	65 - 120
Bromobenzene	5035A-8260B	70 - 135	25	70 - 120
Bromochloromethane	5035A-8260B	65 - 140	25	65 - 130
Bromodichloromethane	5035A-8260B	65 - 140	20	65 - 135
Bromoform	5035A-8260B	50 - 140	30	50 - 135
Bromomethane	5035A-8260B	55 - 150	25	60 - 145
n-Butylbenzene	5035A-8260B	55 - 140	30	70 - 125
sec-Butylbenzene	5035A-8260B	65 - 130	25	70 - 125
tert-Butylbenzene	5035A-8260B	65 - 135	25	70 - 125
Carbon tetrachloride	5035A-8260B	65 - 140	25	65 - 140
Chlorobenzene	5035A-8260B	70 - 125	25	70 - 125
Chloroethane	5035A-8260B	55 - 145	25	55 - 140
2-Chlorotoluene	5035A-8260B	65 - 130	25	70 - 125
4-Chlorotoluene	5035A-8260B	70 - 130	25	70 - 125
Chloroform	5035A-8260B	65 - 130	20	65 - 130
Chloromethane	5035A-8260B	35 - 140	25	40 - 140
1,2-Dibromo-3-chloropropane	5035A-8260B	45 - 145	30	45 - 140
Dibromochloromethane	5035A-8260B	65 - 140	25	65 - 140
1,2-Dibromoethane	5035A-8260B	65 - 135	25	70 - 130
Dibromomethane	5035A-8260B	65 - 135	25	70 - 130
1,2-Dichlorobenzene	5035A-8260B	70 - 130	25	70 - 120
1,3-Dichlorobenzene	5035A-8260B	70 - 125	25	70 - 125
1,4-Dichlorobenzene	5035A-8260B	70 - 125	25	70 - 125
Dichlorodifluoromethane	5035A-8260B	65 - 130	25	65 - 130
1,1-Dichloroethane	5035A-8260B	65 - 130	25	65 - 130
1,2-Dichloroethane	5035A-8260B	60 - 145	25	60 - 140
1,1-Dichloroethene	5035A-8260B	65 - 135	25	70 - 130
cis-1,2-Dichloroethene	5035A-8260B	65 - 130	25	65 - 125
trans-1,2-Dichloroethene	5035A-8260B	65 - 135	25	65 - 130
Dichlorofluoromethane	5035A-8260B	65 - 135	25	65 - 130
1,2-Dichloropropane	5035A-8260B	65 - 125	20	65 - 125
1,3-Dichloropropane	5035A-8260B	65 - 135	25	65 - 125
2,2-Dichloropropane	5035A-8260B	60 - 145	25	60 - 145
1,1-Dichloropropene	5035A-8260B	65 - 135	20	70 - 130
Ethylbenzene	5035A-8260B	70 - 130	25	70 - 125
Hexachlorobutadiene	5035A-8260B	55 - 140	35	60 - 135
Isopropylbenzene	5035A-8260B	65 - 140	25	70 - 125
p-Isopropyltoluene	5035A-8260B	65 - 140	25	70 - 125

Table A-23 Soil/Sediment Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Methylene chloride	5035A-8260B	60 - 140	25	60 - 130
Naphthalene	5035A-8260B	40 - 155	40	50 - 140
n-Propylbenzene	5035A-8260B	65 - 140	25	70 - 125
Styrene	5035A-8260B	70 - 140	25	70 – 130
tert-butyl methyl ether	5035A-8260B	55 - 150	35	55 - 140
1,1,2,2-Tetrachloroethane	5035A-8260B	45 - 155	30	55 - 140
1,1,2,2-Tetrachloroethene	5035A-8260B	65 - 135	25	65 - 125
1,1,1,2-Tetrachloroethane	5035A-8260B	70 - 140	20	70 - 135
Toluene	5035A-8260B	70 - 125	20	70 - 125
1,2,3-Trichlorobenzene	5035A-8260B	50 - 140	30	60 - 130
1,2,4-Trichlorobenzene	5035A-8260B	55 - 135	30	65 - 135
1,1,1-Trichloroethane	5035A-8260B	65 - 140	20	65 - 135
1,1,2-Trichloroethane	5035A-8260B	65 - 135	30	65 - 130
Trichloroethene	5035A-8260B	70 - 135	25	70 - 125
Trichlorofluoromethane	5035A-8260B	70 - 135	25	70 - 125
1,2,3-Trichloropropane	5035A-8260B	55 - 145	30	55 - 135
1,2,4-Trimethylbenzene	5035A-8260B	65 - 135	25	70 - 125
1,3,5-Trimethylbenzene	5035A-8260B	70 - 130	25	70 - 125
Vinyl chloride	5035A-8260B	50 - 135	30	50 - 130
Xylene (total)	5035A-8260B	70 - 125	25	70 - 125
o-Xylene	5035A-8260B	70 - 125	25	70 - 125
m-Xylene	5035A-8260B	70 - 125	25	70 - 125
p-Xylene	5035A-8260B	70 - 125	25	70 - 125
2-Chlorophenol	8270C	40 - 120	20	40 - 120
4-Chloro-3-methylphenol	8270C	50 - 120	25	50 - 120
2,4-Dichlorophenol	8270C	45 - 120	25	45 - 120
2,4-Dimethylphenol	8270C	35 - 120	25	40 - 120
2,4-Dintrophenol	8270C	10 - 120	25	15 - 120
4,6-Dinitro-*o*-cresol	8270C	15 - 120	25	40 - 120
3-Methylphenol	8270C	40 - 120	25	45 - 120
4-Methylphenol	8270C	40 - 120	25	45 - 120
2-Nitrophenol	8270C	40 - 120	25	45 - 120
4-Nitrophenol	8270C	35 - 120	30	40 - 120
Pentachlorophenol	8270C	30 - 125	25	40 - 125
Phenol	8270C	35 - 120	25	35 - 120
2,4,5-Trichlorophenol	8270C	50 - 120	20	50 - 120
2,4,6-Trichlorophenol	8270C	40 - 120	25	50 - 120
Benzoic acid	8270C	15 - 120	30	20 - 120

Table A-23 Soil/Sediment Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
4-Bromophenyl phenyl ether	8270C	45 - 120	20	45 - 120
Butyl benzyl phthalate	8270C	50 - 120	25	55 - 120
2-Chloronaphthalene	8270C	45 - 120	20	45 - 120
4-Chloroaniline	8270C	10 - 120	30	15 - 120
Carbazole	8270C	60 - 120	20	60 - 120
bis(2-Chloroethoxy)methane	8270C	40 - 120	25	45 - 120
bis(2-Chloroethyl)ether	8270C	35 - 110	25	35 - 120
bis(2-Chloroisopropyl)ether	8270C	40 - 120	25	40 - 120
4-Chlorophenyl phenyl ether	8270C	50 - 120	25	55 - 120
2,4-Dintitrotoluene	8270C	50 - 120	25	55 - 120
2,6-Dinitrotoluene	8270C	50 - 120	20	55 - 120
3,3′-Dichlorobenzidine	8270C	15 - 120	25	20 - 120
Dibenzofuran	8270C	55 - 120	25	55 - 120
1,3-Dichlorobenzene	8270C	35 - 120	25	35 - 120
1,4-Dichlorobenzene	8270C	35 - 120	25	35 - 120
di-n-Butyl phthalate	8270C	50 - 120	25	55 - 120
di-n-Octyl phthalate	8270C	45 - 120	25	55 - 120
Diethyl phthalate	8270C	50 - 120	25	50 - 120
Dimethyl phthalate	8270C	45 - 120	25	55 - 120
bis(2-Ethylhexyl)phthalate	8270C	50 - 120	25	55 - 120
Hexachlorobenzene	8270C	40 - 120	25	50 - 120
Hexachlorobutadiene	8270C	40 - 110	25	40 - 120
Hexachlorocyclopentadiene	8270C	20 - 120	30	35 - 120
Hexachloroethane	8270C	35 - 120	30	35 - 120
Isophorone	8270C	40 - 120	20	40 - 120
2-Methylnaphthalene	8270C	45 - 120	20	45 - 120
2-Nitroaniline	8270C	50 - 120	25	50 - 120
3-Nitroaniline	8270C	30 - 120	25	35 - 120
4-Nitroaniline	8270C	40 - 120	30	45 - 120
Nitrobenzene	8270C	40 - 120	25	40 - 120
N-Nitroso-*di-n*-propylamine	8270C	35 - 120	25	40 - 120
N-Nitrosodiphenylamine	8270C	50 - 120	25	50 - 120
1,2,4-Trichlorobenzene	8270C	40 - 120	25	40 - 120
2-Methylphenol	8270C SIM	40 - 120	25	40 – 120
Acenaphthene	8270C SIM	45 - 120	25	50 - 120
Acenaphthylene	8270C SIM	45 - 120	20	50 - 120
Anthracene	8270C SIM	55 - 120	25	55 - 120
Benzo(a)anthracene	8270C SIM	50 - 120	25	55 - 120

Table A-23 Soil/Sediment Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Benzo(a)pyrene	8270C SIM	45 - 125	25	50 - 125
Benzo(b)fluoranthene	8270C SIM	45 - 125	30	45 - 125
Benzo(g,h,i)perylene	8270C SIM	25 - 130	30	35 - 130
Benzo(k)fluoranthene	8270C SIM	45 - 125	30	45 - 125
Chrysene	8270C SIM	55 - 120	25	55 - 120
Dibenzo(a,h)anthracene	8270C SIM	25 - 135	30	40 - 135
Fluoranthene	8270C SIM	45 - 120	25	55 - 120
Fluorene	8270C SIM	50 - 120	25	55 - 120
Indeno(1,2,3-cd)pyrene	8270C SIM	20 - 130	30	30 - 135
Naphthalene	8270C SIM	40 - 120	25	45 - 120
Phenanthrene	8270C SIM	50 - 120	25	50 - 120
Pyrene	8270C SIM	40 - 125	30	45 - 125
Diesel (C12-C23)-TPH	8015B	30 - 125	30	40 - 120
Motor Oil (C23-C40)-TPH	8015B	30 - 125	30	40 - 120
Gasoline (C4-C12)-TPH	5035A-8015B	55 - 145	35	65 - 135
alpha-BHC	8081A	40 - 115	30	60 - 115
beta-BHC	8081A	40 - 120	30	60 - 115
gamma-BHC (Lindane)	8081A	40 - 120	30	55 - 115
delta-BHC	8081A	45 - 120	30	60 - 115
Heptachlor	8081A	40 - 115	30	55 - 115
Aldrin	8081A	40 - 115	30	50 - 115
Heptachlor epoxide	8081A	45 - 115	30	55 - 115
Endosulfan I	8081A	40 - 120	30	40 - 120
Dieldrin	8081A	40 - 125	30	65 - 115
Endrin aldehyde	8081A	30 - 120	30	55 - 115
Endrin	8081A	45 - 125	30	55 - 120
Endosulfan II	8081A	40 - 125	30	55 - 120
4,4′- DDD	8081A	40 - 130	30	60 - 120
Endosulfan sulfate	8081A	45 - 120	30	65 - 115
4,4′-DDT	8081A	35 - 130	30	65 - 120
4,4′-DDE	8081A	35 - 130	30	60 - 120
Methoxychlor	8081A	40 - 135	30	65 - 120
Endrin ketone	8081A	40 - 120	30	65 - 115
alpha-Chlordane	8081A	–NA	NA	–NA
gamma-Chlordane	8081A	–NA	NA	–NA
Toxaphene	8081A	NA	NA	NA
Aroclor-1016	8082	45 - 120	30	60 – 115
Aroclor-1221	8082	NA	NA	NA

Table A-23 Soil/Sediment Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Aroclor-1232	8082	NA	NA	NA
Aroclor-1242	8082	NA	NA	NA
Aroclor-1248	8082	NA	NA	NA
Aroclor-1254	8082	NA	NA	NA
Aroclor-1260	8082	45 - 120	30	60 - 115
2,4,5-T	8151A	27 - 146	35	40 - 121
2,4-D	8151A	32 - 125	35	45 - 112
2,4-DB	8151A	20 - 148	35	32 - 145
Dalapon	8151A	14 - 107	50	27 - 103
Dichlorprop	8151A	39 - 102	40	36 - 107
Dicamba	8151A	39 - 103	35	43 - 117
Dinoseb	8151A	12 - 154	40	22 - 130
MCPA	8151A	37 - 118	35	36 - 118
MCPP	8151A	32 - 115	40	44 - 115
Silvex	8151A	30 - 104	40	44 - 106
Aluminum	6010B	75 - 125	20	80 - 120
Antimony	6020	75 - 125	20	80 - 120
Arsenic	6020	75 - 125	20	80 - 120
Barium	6020	75 - 125	20	80 - 120
Beryllium	6020	75 - 125	20	80 - 120
Boron	6010B	75 - 125	20	80 - 120
Cadmium	6020	75 - 125	20	80 - 120
Calcium	6010B	75 - 125	20	80 - 120
Chromium	6020	75 - 125	20	80 - 120
Cobalt	6020	75 - 125	20	80 - 120
Copper	6020	75 - 125	20	80 - 120
Iron	6010B	75 - 125	20	80 - 120
Lead	6020	75 - 125	20	80 - 120
Magnesium	6010B	75 - 125	20	80 - 120
Manganese	6020	75 - 125	20	80 - 120
Mercury	1631	70 - 130	30	75 - 125
Molybdenum	6020	75 - 125	20	80 - 120
Nickel	6020	75 - 125	20	80 - 120
Potassium	6010B	75 - 125	20	80 - 120
Selenium	6020	75 - 125	20	80 - 120
Silver	6010B	75 - 125	20	80 - 120
Silver	6020	75 - 125	20	80 - 120
Sodium	6010B	75 - 125	20	80 - 120

Table A-23 Soil/Sediment Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Thallium	6020	75 - 125	20	80 - 120
Thorium	6020	75 - 125	20	80 - 120
Uranium	6020	75 - 125	20	80 - 120
Vanadium	6020	75 - 125	20	80 - 120
Zinc	6020	75 - 125	20	80 - 120
Gross α	9310	NA	RPD<30 or RER< 2	75-125
Gross β	9310	NA	RPD<30 or RER< 2	75-125
Radium-226	HASL 300 (Section 4.5.2.3)	70-130	RPD<30 or RER< 2	75-125
Radium-228	HASL 300 (Section 4.5.2.3)	70-130	RPD<30 or RER< 2	75-125
Thorium-228	HASL 300	70-130	RPD<30 or RER< 2	75-125
Thorium-230	HASL 300	70-130	RPD<30 or RER< 2	75-125
Thorium-232	HASL 300	70-130	RPD<30 or RER< 2	75-125
Uranium-234	HASL 300	70-130	RPD<30 or RER< 2	75-125
Uranium-235	HASL 300	70-130	RPD<30 or RER< 2	75-125
Uranium-238	HASL 300	70-130	RPD<30 or RER< 2	75-125
TS	160.3	NA	10	NA
TS	2540G	NA	10	NA

Notes:

NA Not Applicable

a - The limits presented for these QC analyses are laboratory-derived limits. These limits will periodically be updated; however, the updated limits are not expected to be significantly different than those herein. Laboratory corrective actions will be taken based on the current laboratory-derived limits.

b - Precision limit for matrix spike/matrix spike duplicate, laboratory duplicate, or laboratory control sample/ laboratory control sample duplicate analyses.

Table A-24 Air Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Aluminum	6010B	NA	20	75-125
Aluminum	IO3.3	NA	20	75-125
Arsenic	6020	NA	20	75-125
Arsenic	IO3.3	NA	20	75-125
Barium	6020	NA	20	75-125
Beryllium	6020	NA	20	75-125
Cadmium	6020	NA	20	75-125
Cadmium	IO3.3	NA	20	75-125
Calcium	6010B	NA	20	75-125
Chromium	6020	NA	20	75-125
Chromium	IO3.3	NA	20	75-125
Cobalt	6020	NA	20	75-125
Cobalt	IO3.3	NA	20	75-125
Copper	6020	NA	20	75-125
Copper	IO3.3	NA	20	75-125
Iron	6010B	NA	20	75-125
Lead	6020	NA	20	75-125
Magnesium	6010B	NA	20	75-125
Manganese	6020	NA	20	75-125
Manganese	IO3.3	NA	20	75-125
Mercury	7471A	NA	20	75-125
Molybdenum	6020	NA	20	75-125
Nickel	6020	NA	20	75-125
Nickel	IO3.3	NA	20	75-125
Selenium	6020	NA	20	75-125
Silver	6020	NA	20	75-125
Sodium	6010B	NA	20	75-125
Vanadium	6020	NA	20	75-125
Zinc	6020	NA	20	75-125
Sulfate	9056	NA	15	85-115
Gross α	900.0	NA	RPD<30 or RER< 3	75-125
Gross β	900.0	NA	RPD<30 or RER< 3	75-125
Radium-226	903.1	NA	RPD<30 or RER< 3	75-125
Radium-228	904.0	NA	RPD<30 or RER< 3	75-125
Radium, Total	IO3.3	NA	NA	75-125

Table A-24 Air Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Thorium-228	HASL 300	NA	RPD<30 or RER< 3	75-125
Thorium-230	HASL 300	NA	RPD<30 or RER< 3	75-125
Thorium-232	HASL 300	NA	RPD<30 or RER< 3	75-125
Thorium, Total	IO3.3	NA	NA	75-125
Uranium-234	HASL 300	NA	RPD<30 or RER< 3	75-125
Uranium-235	HASL 300	NA	RPD<30 or RER< 3	75-125
Uranium-238	HASL 300	NA	RPD<30 or RER< 3	75-125
TSP	40 CFR Appendix B	NA	NA	NA
PM-10	40 CFR Appendix J	NA	NA	NA

Notes:

NA Not Applicable

a - The limits presented for these QC analyses are laboratory-derived limits. These limits will periodically be updated; however, the updated limits are not expected to be significantly different than those herein. Laboratory corrective actions will be taken based on the current laboratory-derived limits.

b - Precision limit for laboratory duplicate or laboratory control sample/ laboratory control sample duplicate analyses.

Table A-25 Biota Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD or RER[b]**	**LCS Accuracy, %**
Aluminum	6010B	80-120	20	80-120
Antimony	6020	80-120	20	80-120
Arsenic	6020	80-120	20	80-120
Barium	6020	80-120	20	80-120
Beryllium	6020	80-120	20	80-120
Boron	6020	80-120	20	80-120
Cadmium	6020	80-120	20	80-120
Chromium	6020	80-120	20	80-120
Cobalt	6020	80-120	20	80-120
Copper	6020	80-120	20	80-120
Lead	6020	80-120	20	80-120
Manganese	6020	80-120	20	80-120
Mercury	7471A	85-115	20	85-115
Molybdenum	6020	80-120	20	80-120
Nickel	6020	80-120	20	80-120
Selenium	6020	80-120	20	80-120
Silver	6010B	80-120	20	80-120
Strontium	6010B	80-120	20	80-120
Thallium	6020	80-120	20	80-120
Thorium	6020	80-120	20	80-120
Tungsten	6020	80-120	20	80-120
Uranium	6020	80-120	20	80-120
Vanadium	6020	80-120	20	80-120
Zinc	6020	80-120	20	80-120
Fluoride	340.2	80-120	20	90-110
Aroclor-1016	8082	60-120	30	60-120
Aroclor-1221	8082	NA	NA	NA
Aroclor-1232	8082	NA	NA	NA
Aroclor-1242	8082	NA	NA	NA
Aroclor-1248	8082	NA	NA	NA
Aroclor-1254	8082	NA	NA	NA
Aroclor-1260	8082	60-125	30	60-125

Notes:

NA Not Applicable

a - The limits presented for these QC analyses are laboratory-derived limits. These limits will periodically be updated; however, the updated limits are not expected to be significantly different than those herein. Laboratory corrective actions will be taken based on the current laboratory-derived limits.

b - Precision limit for laboratory duplicate or laboratory control sample/ laboratory control sample duplicate analyses.

Table A-26 TCLP Samples Analytical Methods and Laboratory Accuracy and Precision Goals[a]				
Parameter	**Analytical Method**	**MS Accuracy, %**	**Precision, RPD[b]**	**LCS Accuracy, %**
Vinyl chloride	1311 8260B	40 - 135	30	50 - 130
1,1-Dichloroethene	1311 8260B	60 - 135	20	70 - 130
Chloroform	1311 8260B	65 - 135	20	65 - 130
1,2-Dichloroethane	1311 8260B	60 - 140	20	60 - 140
2-Butanone	1311 8260B	30 - 140	40	40 - 135
Carbon tetrachloride	1311 8260B	65 - 140	25	65 - 140
Trichloroethene	1311 8260B	60 - 125	20	70 - 125
Benzene	1311 8260B	60 - 125	20	65 - 120
Tetrachloroethene	1311 8260B	60 - 130	20	65 - 125
Chlorobenzene	1311 8260B	70 - 125	20	70 - 125
1,4-Dichlorobenzene	1311 8260B	70 - 125	20	70 - 125
2,4-Dinitrotoluene	1311 8270C	60 - 120	25	60 - 120
Hexachlorobenzene	1311 8270C	45 - 125	20	50 - 120
Hexachlorobutadiene	1311 8270C	40 - 120	25	40 - 120
Hexachloroethane	1311 8270C	35 - 120	25	35 - 120
2-Methylphenol	1311 8270C	NA	NA	NA
3&4-Methylphenol	1311 8270C	NA	NA	NA
Nitrobenzene	1311 8270C	50 - 120	25	50 - 120
Pentachlorophenol	1311 8270C	45 - 130	25	50 - 120
Pyridine	1311 8270C	30 - 120	30	30 - 120
2,4,5-Trichlorophenol	1311 8270C	60 - 120	20	60 - 120
2,4,6-Trichlorophenol	1311 8270C	60 - 120	20	60 - 120
2,4-D	1311 8151A	30 - 150	50	30 - 150
2,4,5-TP	1311 8151A	30 - 150	50	30 - 150
gamma-BHC (Lindane)	1311 8081A	40 - 120	30	40 - 120
Chlordane	1311 8081A	NA	NA	NA
Endrin	1311 8081A	55 - 120	30	55 - 120
Heptachlor	1311 8081A	40 - 115	30	40 - 115
Heptachlor epoxide	1311 8081A	50 - 120	30	50 - 120
Methoxychlor	1311 8081A	55 - 125	30	55 - 120
Toxaphene	1311 8081A	NA	NA	NA
Arsenic	1311 6010B	75 - 125	20	80 - 120
Barium	1311 6010B	75 - 125	20	80 - 120
Cadmium	1311 6010B	75 - 125	20	80 - 120
Chromium	1311 6010B	75 - 125	20	80 - 120
Lead	1311 6010B	75 - 125	20	80 - 120
Silver	1311 6010B	75 - 125	20	80 - 120
Mercury	1311 7470A	65 - 135	20	85 - 120
Selenium	1311 6010B	75 - 125	20	80 - 120

Notes:

NA - Not Applicable

a - The limits presented for these QC analyses are laboratory-derived limits. These limits will periodically be updated; however, the updated limits are not expected to be significantly different than those herein. Laboratory corrective actions will be taken based on the current laboratory-derived limits.

b - Precision limit for matrix spike/matrix spike duplicate, laboratory duplicate, or laboratory control sample/ laboratory control sample duplicate analyses.

Table A-27 Analytical Methods and Laboratory Surrogate Recovery Goals			
Matrix	**Method**	**Surrogate Compound[a]**	**Recovery Limits (%)[b]**
Aqueous	8260B	4-Bromofluorobenzene	80 - 120
Aqueous	8260B	Dibromofluoromethane	80 - 120
Aqueous	8260B	Toluene-D8	80 - 120
TCLP	1311 8260B	4-Bromofluorobenzene	80 - 120
TCLP	1311 8260B	Dibromofluoromethane	80 - 120
TCLP	1311 8260B	Toluene-D8	80 - 120
Aqueous	625 LL	2,4,6-Tribromophenol	40-120
Aqueous	625 LL	2-Fluorobiphenyl	50-120
Aqueous	625 LL	2-Fluorophenol	30-120
Aqueous	625 LL	Nitrobenzene-d5	45-120
Aqueous	625 LL	Phenol-d6	35-120
Aqueous	625 LL	Terphenyl-d14	50-125
Aqueous	8270C SIM	2-Fluorobiphenyl	50-120
Aqueous	8270C SIM	Nitrobenzene-d_5	45-120
Aqueous	8270C SIM	Terphenyl-d_{14}	50-125
TCLP	1311 8270C	2,4,6-Tribromophenol	50 - 125
TCLP	1311 8270C	2-Fluorobiphenyl	45 - 120
TCLP	1311 8270C	2-Fluorophenol	35 - 120
TCLP	1311 8270C	Nitrobenzene-d5	45 - 120
TCLP	1311 8270C	Phenol-d6	45 - 120
TCLP	1311 8270C	Terphenyl-d14	45 - 135
Aqueous	8015B-Diesel/Motor Oil	n-Octacosane	40 - 125
Aqueous	8015B-Gasoline	4-Bromofluorobenzene	65 - 140
Aqueous	8151A	2,4-DCAA	40 - 160
TCLP	1311 8151A	2,4-DCAA	20 - 150
Aqueous	8081A LL	Decachlorobiphenyl	10-147
Aqueous	8081A LL	Tetrachloro-m-xylene	39-130
TCLP	1311 8081A	Decachlorobiphenyl	45 - 120
TCLP	1311 8081A	Tetrachloro-m-xylene	35 - 115
Aqueous	8082 LL	Decachlorobiphenyl	45-128
Aqueous	8082 LL	Tetrachloro-m-xylene	45-128
Soil	8260B	4-Bromofluorobenzene	80 - 120
Soil	8260B	Dibromofluoromethane	80 - 125
Soil	8260B	Toluene-D8	80 - 120
Soil	8270C	2,4,6-Tribromophenol	35 - 125
Soil	8270C	2-Fluorobiphenyl	35 - 120
Soil	8270C	2-Fluorophenol	25 - 120
Soil	8270C	Nitrobenzene-d5	30 - 120

Table A-27 Analytical Methods and Laboratory Surrogate Recovery Goals			
Matrix	**Method**	**Surrogate Compound[a]**	**Recovery Limits (%)[b]**
Soil	8270C	Phenol-d6	35 - 120
Soil	8270C	Terphenyl-d14	40 - 135
Soil	8270C SIM	2-Fluorobiphenyl	35 - 120
Soil	8270C SIM	Nitrobenzene-d5	30 - 120
Soil	8270C SIM	Terphenyl-d14	40 - 135
Soil	8015B-Diesel/Motor Oil	n-Octacosane	40 - 125
Soil	5035A-8015B	4-Bromofluorobenzene	70 - 135
Soil	8081A	Decachlorobiphenyl	45 - 120
Soil	8081A	Tetrachloro-m-xylene	35 - 115
Soil	8082	Decachlorobiphenyl	45 - 120
Soil	8082	Tetrachloro-m-xylene	35 - 115
Soil	8151	2,4-DCAA	30 - 140
Biota	8082	Decachlorobiphenyl	65-125
Biota	8082	Tetrachloro-m-xylene	60-125

Notes:

a - The specific surrogate compounds utilized for an analytical method may change due to method updates or other factors.

b - The limits presented for these QC analyses are laboratory-derived limits. These limits will periodically be updated; however, the updated limits are not expected to be significantly different than those herein. Laboratory corrective actions will be taken based on the current laboratory-derived limits.

Table A-28 Analytical Methods and Laboratory Chemical Yield Goals			
Matrix	**Method**	**Carrier/Tracer[a]**	**Yield Limits (%)[b]**
Aqueous	903.0	Ba-133/Y	40-115
Aqueous	904.0	Ba-133/Y	40-115
Aqueous	HASL 300	Th-234	25-115
Aqueous	HASL 300	U-232	25-115
Soil	Ra-226/HASL 300	NA	NA
Soil	Ra-228/HASL 300	NA	NA
Soil	HASL 300	Th-229	25-115
Soil	HASL 300	U-232	25-115
Air	HASL 300	Th-229	20 – 115%
Air	903.1	Ba-133/Y	20 – 115%
Air	904.0	Ba-133/Y	20 – 115%
Air	HASL 300	U-232	20 – 115%

Notes:
NA Not Applicable
a - The specific tracers/carriers utilized for an analytical method may change due to method updates or other factors.
b - The limits presented for these QC analyses are laboratory-derived limits. These limits will periodically be updated; however, the updated limits are not expected to be significantly different than those herein. Laboratory corrective actions will be taken based on the current laboratory-derived limits.